

# AMERICAN JOURNAL OF OPHTHALMOLOGY

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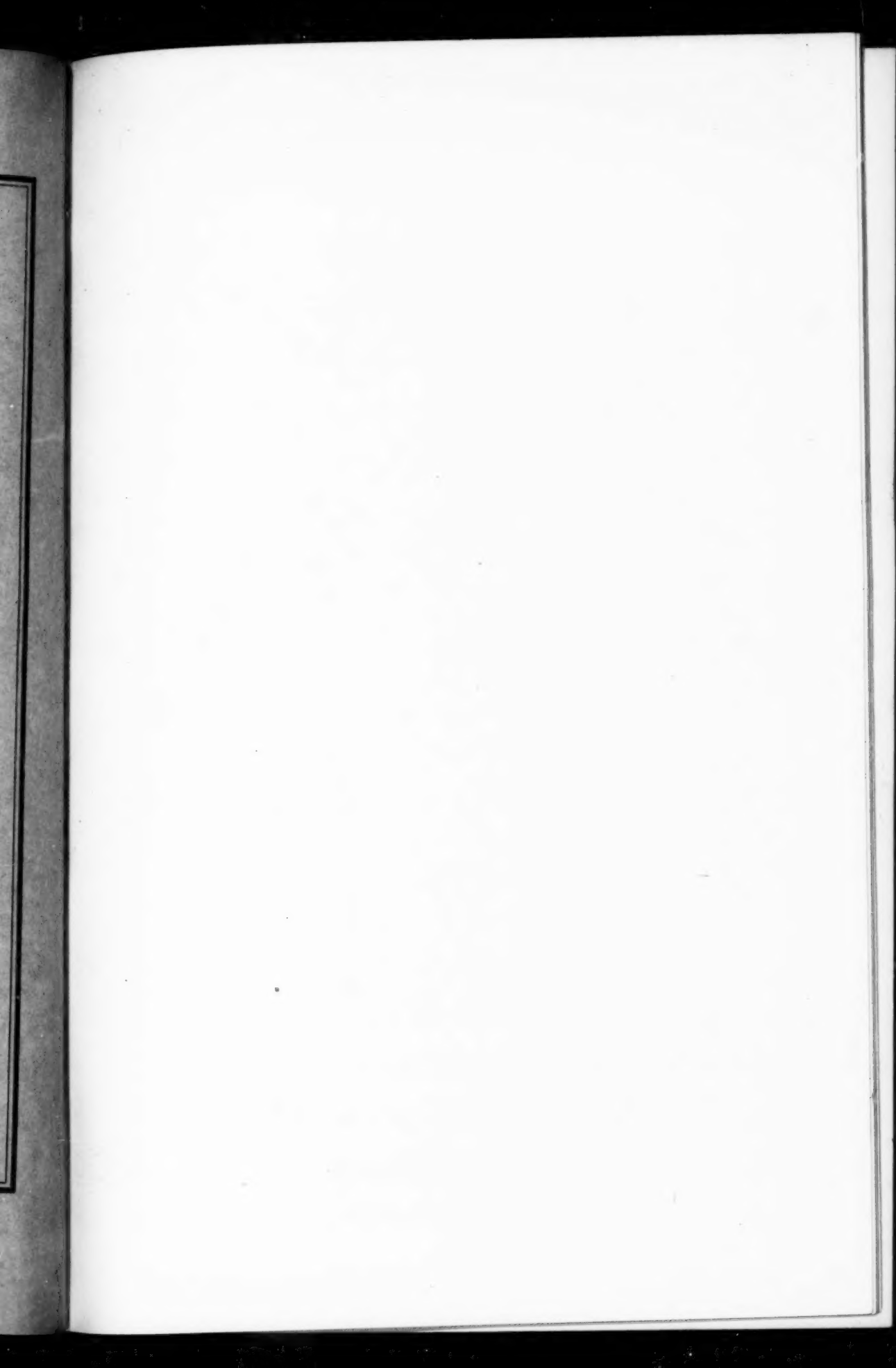
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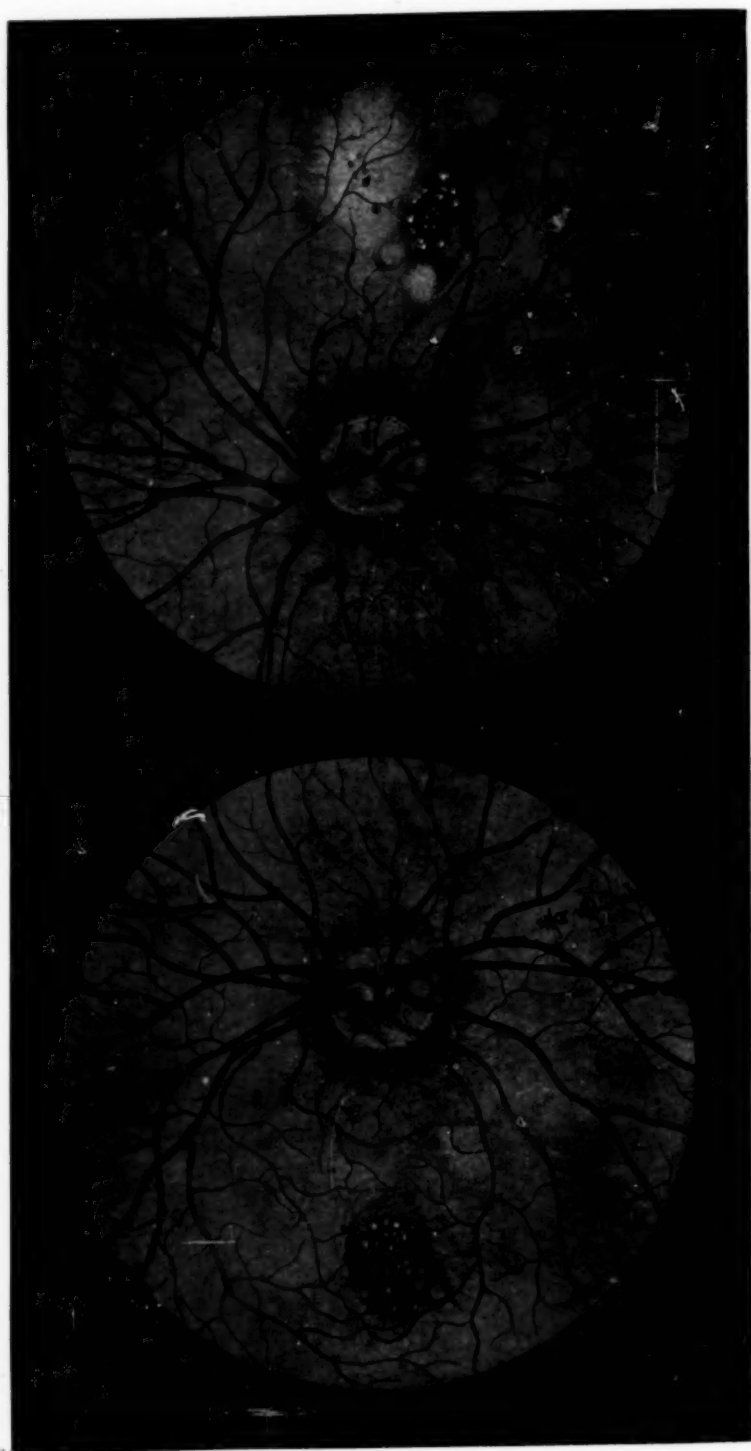
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RIGHT EYE  
BILATERAL HOLE IN THE MACULA DUE TO ONE INJURY. CASE OF DR. T. M. LI  
APPEARANCE ONE YEAR AFTER INJURY.

LEFT EYE

# AMERICAN JOURNAL OF OPHTHALMOLOGY

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No. 1

## HOLE IN THE MACULAR REGION OF BOTH EYES DUE TO SIMULTANEOUS INJURY.

DR. T. M. LI.

PEKING, CHINA.

This is a unique case of traumatic hole in the macula, both eyes being affected by the same injury. Improvement of vision occurred under treatment. The charts give the effects on the field of vision. The color plate shows the appearance of the lesions in the macula; and in other parts the normal fundus of the Chinese.

A Chinese soldier came to the eye clinic of the Peking Union Medical College Hospital on February 19, 1921, for treatment of blurring of vision of both eyes. He was sent by his commanding officer from Taiyuanfu, the capital of Shansi Province, a city two hundred miles from Peking. He was 22 years of age, alert, well built and strong.

The history as given by him on admission was, that eight months ago, while playing in a game of soccer, which is becoming a common sport in China, he was struck squarely on the face by the foot-ball. The force was so tremendous that he was knocked violently to the ground. He was unconscious for about ten minutes, and had to be carried to the barracks. It is uncertain whether this state was caused by the force of the blow or by the violence of his fall.

After regaining consciousness he experienced great difficulty in opening his eyes, probably due to the irritation of dirt particles or corneal abrasions. When he finally succeeded in opening them, he noticed that all objects appeared hazy and reddish. Two days later, objects appeared greenish to his right eye. Within a month this symptom disappeared, but his vision was much impaired. Instead of seeing green at the same time as his right eye did, his left eye saw many black lines and spots. In a few days these disappeared, and then objects appeared greenish to this eye. As with the right eye, this symptom gradually disappeared during the course of a month, but his vision was

very much impaired. Prior to the injury, the vision of both eyes had always been excellent. His vision slowly improved for a period of about three months, but came to a standstill after that.

Upon examination the following findings were noted: Vision R. 6/20 and L. 6/60. No lenses improved his vision. Tests by the retinoscope and ophthalmoscope prove his eyes to be practically emmetropic. External examination shows nothing abnormal. Both pupils are semidilated, the right being a little larger than the left. Both react somewhat sluggishly to light and accommodation. Consensual reaction is present, but also rather sluggish. The tension of both eyes is normal.

There is no nystagmus or squint. Patient fixes with either eye, but complains of a central shadow when he does so. With a Peter's campimeter, the right eye shows a relative central scotoma, oval in shape, with its long axis horizontal. Above, below and to the nasal side it extends to about 5° from the center; the temporal side to about 7.5°. The left eye also shows a relative central scotoma, slightly smaller than the right and more irregular in shape. Beneath this there is a relative paracentral scotoma, shaped like a small bean and somewhat larger than the central one. The patient sees the test object clearly in all other parts of the field. Color vision is not affected except in these areas. (Fig. 1.)

Ophthalmoscopic examination revealed the following findings: R. The media are clear, disc almost round and

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slightly hyperemic, its margin sharply defined and regular, arteries normal, veins slightly engorged where they emerge from the disc. There is a thin film of grayish fibrous membrane covering a small area of the center of the disc. The fundus is normal with the exception of the macular region. A little more than two disc diameters to the temporal side of the disc, there is a dark red sharply defined oval area. Its long axis is practically horizontal, and its length is about two-thirds of a disc diameter. Its width is a trifle less than one-half of a disc diameter. This red

L. Media clear, disc slightly vertically oval, a little hyperemic, margin regular and well defined, arteries and veins normal. About two and one-half disc diameters to the temporal side of the disc and below the level corresponding to the lower margin of the disc, there is a dark red oval hole which looks exactly like the one seen in the right eye. The long axis lies in about the  $165^\circ$  meridian. This oval is a trifle smaller than the right. The same kind of a light red zone surrounds it. In the oval hole and around its margin there are also numerous fairly round

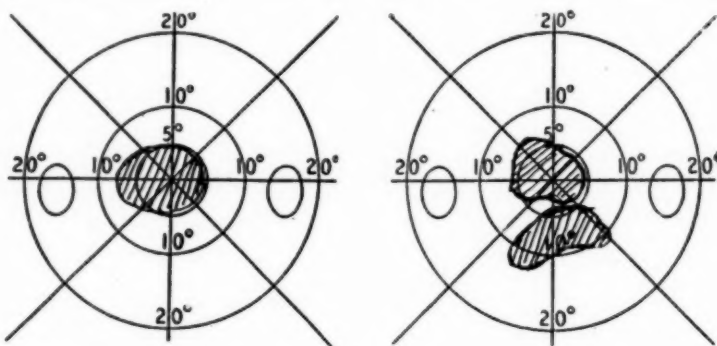


Fig. 1.—Diagrams of the relative scotomas, determined by Peter's campimeter. Obviously it was very difficult to map out these areas, since the central vision was affected; but after considerable effort and many explanations the result as shown above was obtained.

oval area has a decidedly punched out appearance suggesting a hole. Within this hole, there are numerous small whitish spots of various sizes. Surrounding the oval, there is a hazy, reddish ring, which is of a lighter shade than the color at the bottom of the oval hole, but darker than the surrounding retina. Within this zone of red and close to the margin of the hole, with the exception of the upper temporal quadrant, there are numerous small, fairly round white spots. Immediately beneath the temporal end of the hole are several round yellowish spots. Beyond the outer zone of red, there are numerous fine whitish radiating striae. Between the disc and the hole, and about one disc diameter below the level of the two, there is a stippled area which measures about one-third disc diameter across. No floating opacities visible in the vitreous.

yellowish and whitish spots. The former are generally smaller than the latter. A little above and a little to the nasal side from the hole, there are several light yellowish round spots. Immediately above the hole and extending above and to the temporal side there is a large whitish patch approximately twice the size of the disc. This area is stippled with numerous fine discrete pigmented spots. No floating opacities in the vitreous.

A blood Wassermann was performed and found to be negative. The urine was also normal.

With the history of a blow on the eye, the immediate impairment of vision, and the characteristic fundus picture, the diagnosis of hole in both macular regions was made. According to the patient's statement, the greatest force of the blow was received on the right side of his face, but from the fact that the vision of both eyes was im-

mediately diminished, the cause of which is apparent from the damage seen in both macular regions, it is obvious that the blow must have struck both eyes quite squarely.

The Chinese, as a race, have a wide, low nasal bridge, and a low superciliary ridge. Their eyeballs as a rule are not so deeply set in the orbits as those of a Westerner; consequently they are not so well protected. In this soldier's



Fig. 2.—Patient who suffered hole in the macula of both eyes from one blow.

case, as seen by the picture, his eyes would be considerably exposed to such injury as he received. Under the same circumstances, a Westerner would probably have a monocular involvement, since his comparatively high nasal bridge and prominent superciliary ridge would very likely divert the direction of the ball away from one eye. If the force were very severe, he would probably have a fracture of the bridge of his nose in addition to a monocular injury.

No treatment except potassium iodid, 0.30 gm. t.i.d. has been given. For three months following the first visit his vision slowly improved. On April 19, that is, at the end of two

months, his vision was R. 6/20 and L. 6/20 minus 1. On April 29, his vision was R. 6/15 minus 1, and L. 6/20. On May 26, it was R. 6/15 and L. 6/20. The improvement in vision, which has probably come to a standstill, was quite marked in his left eye. (Fig. 3.)

The colored picture, Plate I, represents the condition of the fundus of the eyes about four and a half months after they were first seen, or about one year after the injury. Numerous changes have occurred during this period. Tho not marked, they may be of interest to report: The hole in the macula of the right eye was originally very much darker red in color; the white spots within the hole were much smaller and less numerous. The reddish ring surrounding the hole was narrower and less distinct. There were only three or four round spots surrounding the margin of the hole and they were much smaller and less distinct. The radiating striae were fewer and much less conspicuous than at present. The changes both within and around the hole of the left eye are the same as those of the right eye. The atrophic patch above the hole was not so white and extensive, but the areas of pigment were larger and less numerous. The several light yellowish round spots, a little above and to the nasal side from the hole, were not seen when the patient was first examined. All the changes are indicative of atrophy and fibrous contractions.

The hole in the macula of the right eye involves the fovea centralis. In the left eye, the hole is below the fovea, which, however, is included in an area of degenerative changes involving both retina and choroid.

The writer has searched the literature as far as possible, and finds that all reported cases of hole in the macula due to traumatism have been monocular. The only case of binocular involvement of the retina was described by R. Foster Moore in the March issue of the *Ophthalmic Review* in 1910. But in his case there was a hole in the macula of the right eye only, altho

a circular area of edema existed in the macula region of both eyes.

Major Middleton, in the *American Journal of Ophthalmology* of November, 1919, reported 23 cases of hole in the macular region discovered in the course of an examination of 100,000 recruits. All of these cases were monocular in character, and each presented a history of previous injury to the affected eye. Major Maxey in the same issue reported three cases of hole in the macula found among colored troops whom he had examined at Camp Sher-

his definitely excluding that disease from further consideration. In the second place, the associated ocular inflammation referred to could easily have been coincidental. At any rate, any one of these inflammations could have existed in a low grade of practically quiescent state since an injury in childhood, which could have caused the hole in the macula. The flare up later in life could have been brought about by focal infection or by trauma of an operation. The inference therefore is that all cases of hole in the

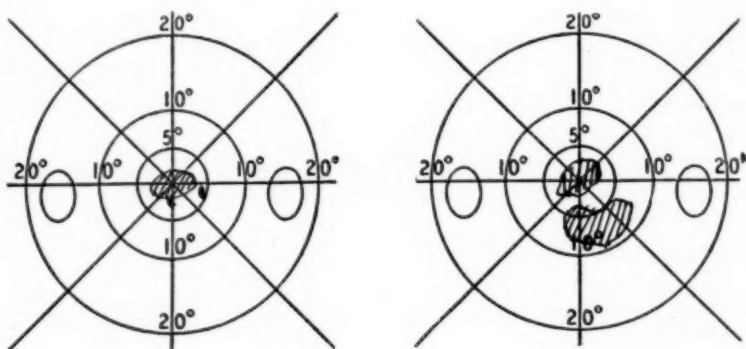


Fig. 3.—There was considerable diminution in the course of three months in the size of the scotomas as seen by the above diagrams.

man. These also were monocular and associated with history of previous injury. It is interesting to note that the majority were baseball injuries.

In the *American Encyclopedia of Ophthalmology*, the statement is made that cases have been reported in which there was no history of trauma found at all, and that such cases are usually associated with some other pathologic conditions of the eye like ulcerative keratitis, uveitis, albuminuric retinitis, iridocyclitis, etc. If the above statement is made for the purpose of proving that the etiologic factor of some cases of hole in the macula may be some extra- or intraocular inflammation, the argument to the writer seems to be weak. For in the first place, the inability to secure a history of trauma does not necessarily exclude the trauma factor, any more than a physician's inability to obtain from a case a history of syphilis should warrant

macula are probably of traumatic origin.

The special features of this unique case are:

1. The binocular character of the case, which is probably the only one on record.

2. The first case of hole in the macula reported in a Chinese.

3. The anatomic peculiarities of the Chinese face explain the possibility of producing a hole in both macular regions from a simultaneous injury.

4. The injury was sustained while playing a Western game. Most of the cases recorded were caused by injury during play.

5. The slow improvement of vision during the course of a year following the injury. Whether or not the administration of potassium iodid assisted in the improvement of vision is impossible to state, but the treatment apparently was worth the trying.

## THE TREATMENT OF TUMORS OF THE HYPOPHYSIS.

JULIUS FEJER, M.D.

BUDAPEST, HUNGARY.

This paper mentions the therapeutic results reported by others, and gives the record of two cases in which X-ray treatment was followed by striking improvement. The exact dosage and method of application is given.

The diagnosis and treatment of tumors of the hypophysis has progressed considerably in the last fifteen years. Regarding the early diagnosis, the evidence from X-ray examination and the examination and photography of the base of the brain and the sella turcica play an important part. Regarding treatment, surgical or rhinologic intervention is now adopted to interrupt the course of the disease and to prevent total blindness. In these

in which X-ray treatment was followed by amelioration and cure. K pferle and von Szily have declared that they consider operation indicated only when there is rapidly increasing compression of the brain. It is also indicated in teratoma, glioma or sarcoma which resist X-ray treatment. These tumors are not radiosensible. Finally Schaefer, of the clinic of Jadason, reported four cases in which there was great improvement. He has determined the

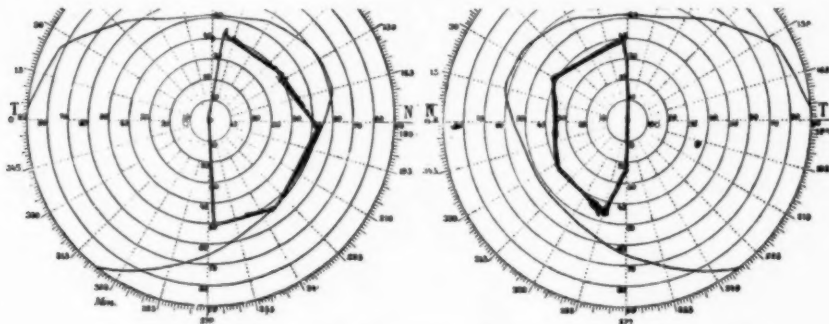


Fig. 1.—Fields of Case 1, July 17, 1920. Typical bitemporal hemianopsia

methods some advance has been made. The Horsley-Killian intracranial operation, the Schloffer-Eiselberg nasal operation, the Chiari-Kahler paranasal operation and the Hirsch intranasal operation are so dangerous, from the point of view of infection thru cerebral abscess or meningitis, that we welcome all procedures which do not open the skull and yet attempt to influence the degenerative effect, i.e., the atrophy of the tumors.

Becl re, at the Society of Parisian Hospital Physicians in 1908, declared that the X-ray plays an important part not only in the early diagnosis of tumors of the hypophysis, but also in their treatment. He has reported five cases in which the vision was improved and the field enlarged. After him, Gramenga-Gunsett, Darier, Fleischer, J ngling and Gavazenni reported cases

technic of raying and the strength of ray necessary to penetrate sufficiently deep, and yet not to cause any disagreeable epiphenomena, such as the falling of hair or discomfort in the eye.

I shall not discuss the technic, as I am not versed in Roentgenology, but shall refer the reader to Schaefer's essay, published in *Strahlentherapie*. For the treatment, the arrangements must be of the best as the rays must penetrate to a depth of 7cm. For this symmetric instruments are necessary.

The following cases were treated by me with the advice of Dr. E. Bird, Roentgenologist. The result, especially in one of them, seems to justify a detailed report.

CASE 1. A merchant, 43 years old, came to me on July 17, 1920, complaining of great fatigue on reading and of the letters running together. This was

so great as to prevent his performing his office duties. There was no external change in the eyes; they moved freely; the pupils were clear, but there was decoloration in the papillae, especially externally, and in the lower sector internally. Vision was R. 5/10, L. 5/15, not improved by glasses. In the visual field there was a typical temporal defect, bitemporal hemianopsia (Fig. 1).

He had no syphilis; the nose and the frontal, maxillary and ethmoid sinuses

to return to his work. There was no change in the fundi. The decoloration as it was on December 11, is shown in the accompanying illustration. The treatment ceased at this time, but I have continued to examine the patient's fundi, vision and fields.

CASE II. This patient, 49 years old, was the wife of one of my colleagues. He had observed in November, 1917, disease in the left eye. By September, 1919, she had lost the vision of this

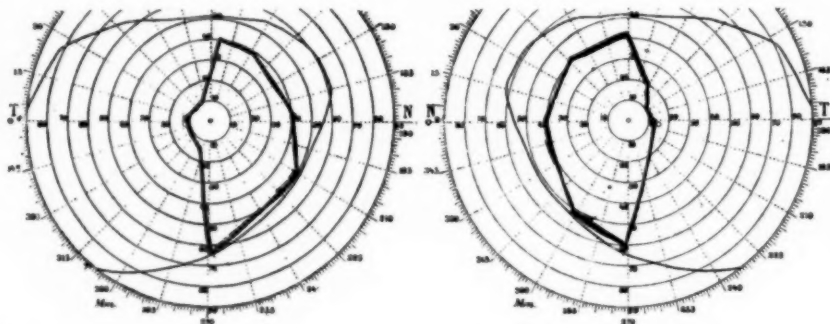


Fig. 2.—Fields of Case 1, December 11, 1920. Extending beyond median line so as to include fixation point.

were negative. The nervous system was normal according to the examination of E. Frey, a teacher in the University.

The Roentgen examination by Dr. Bird showed that the sella turcica was enlarged to twice its normal size, and its walls were greatly attenuated. The lines of the skull were noticeably enlarged. The sphenoid sinus was compressed by the enlarged sella turcica. My diagnosis was therefore confirmed by the Roentgen examination.

The patient was treated by X-ray. There were in all three treatments, each lasting two hours, each side of the skull being rayed for half an hour. There were no disagreeable results, other than the insignificant headache and the Roentgen nausea.

After each treatment, I examined the vision and the fields. On December 11, 1920, the boundaries of the fields extended in several places beyond the median line. In each eye the vision was 5/10, even 5/7 partly. Especially conspicuous was the subjective improvement. The patient was soon able

eye. She first came to me in May, 1920. There was atrophy of the left optic nerve. Vision R. was 5/5. The fundus, the central color vision and the field were entirely normal.

Examinations of the nose, the nasal sinuses, the urine, the blood and the nervous system were all negative. The Roentgen examination of the base of the brain and the sella turcica showed a slight extension of the latter. This was not so characteristic as to make the diagnosis positive, especially as there was no contraction of the right visual field (Fig. 3) and no change in the nervous system. I suspected the disease to be tumor of the hypophysis and advised observation.

After a period of rest, the vision of the patient's right eye had on September 14th, diminished to 5/30. There was a central scotoma for color, concentric contraction of the visual field, and paling of the optic nerve. By the end of October, she became totally blind. But the paling of the papilla did not keep pace with the blindness. I consulted Professors Ranschburg

and Balint but they considered the diagnosis uncertain. They suspected a disease of the internal secretions, but were unable to affirm that it was tumor of the hypophysis. Other symptoms, such as the early cessation of menstruation and the falling of the hair from the arm pits, had seemed to me to confirm that diagnosis. The patient was quite apathetic and indifferent to what was done for her. She was an-

obliged to remain in bed, not recovering until the 12th of October. Light perception returned in the right eye, and improved from day to day, so that she could count fingers at from 1 to 2 M. and recognize large objects. However, there was still a slight defect in the external part of the field and the appearance of the fundus, including the decoloration, remained the same.

On the 24th of December, a second

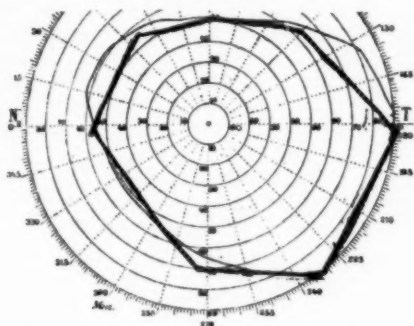


Fig. 3.—Right field of Case 2, May 20, 1920

noyed by the examinations and consultations of physicians, and begged to be let alone. Her face wore an agonized expression.

At this time, the report of Dr. Bird on the X-ray findings was that the sella turcica had increased in size downward as well as longitudinally and latitudinally. A little above the location of the posterior clinoid process, there was a spot the size of a pepper corn and calcareous in density. It might be a particle of the posterior clinoid process separated by ulceration, but was probably a calcareous excrescence. The anterior clinoid process was thick and there were traces of acromegaly. The posterior part of the sphenoid sinus was indented, and in the axial plate it could be seen that the sella turcica was enlarged in a transverse direction.

The diagnosis of tumor of the hypophysis was finally confirmed, and the advice of Dr. Bird for X-ray treatment was accepted. The first treatment took place October 1st, lasting for two hours, each side being exposed for half an hour. It was followed by severe Roentgen nausea, headache, vertigo and nervousness. The patient was

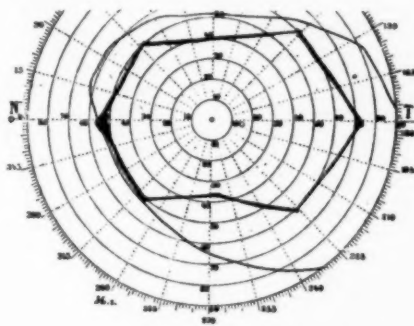


Fig. 4.—Right field of Case 2, December, 1920

treatment was given. This was followed by less nausea. She could count fingers at 3 M., and the visual field was enlarged into the external portion. The patient was satisfied with her vision and was enabled to carry on her household duties. Her interest in life began to return and she seemed brighter and less irritable. The third treatment was administered in the middle of January, and was followed only by slight nausea.

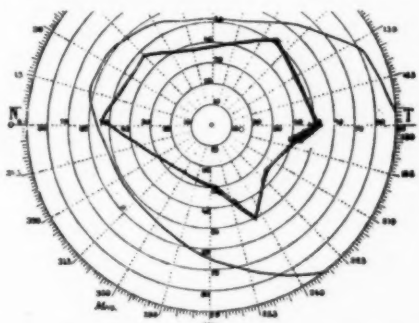


Fig. 5.—Right field Case 2 following improvement by X-ray treatment

When I examined the patient on January 31, vision had increased to 5/10 with +5.0 sph. She read the fifth row of Liebermann's reading book. The

visual field was enlarged and had lost its hemianopsic character, altho there was a greater defect in the inferior portion of the field than in the superior portion. At the center of the field, she recognized red, green and blue, which she had not been able to do since September, 1920. The appearance of the fundus was unchanged. The patient was in excellent spirits.

I cannot explain the improvement in these two cases, and neither could the other observers. They say that the radiosensible part of the tumor was

destroyed. One circumstance is certain, that the tumor was radiosensible; but what its pathology was and what anatomic or microscopic change took place, aplasia or atrophy, we cannot affirm. The optic nerves permit for a time a certain degree of compression, and we can thereby explain the increased conductivity of the nerve fibers. At all events I considered it my duty to report the cases to my colleagues that they too might experiment with Roentgen treatment in tumors of the hypophysis.

## A CLASSIFICATION OF CORNEAL AFFECTIONS.

F. PHINIZY CALHOUN, M.D.

ATLANTA, GA.

United action for the selection and adoption of a standard classification of corneal affections is here proposed. A form for such classification is suggested, and the need for something of the kind brought out by a collection of the enormous number of terms used in the literature to designate these different conditions.

Students of ophthalmology must be impressed with the confused terminology and the chaotic classification of corneal affections. In my endeavor to correct this confusion, I have collected from the various text-books on ophthalmology and the general literature of the subject the varied and various modern and obsolete terms relating to corneal affections, and have prepared a schema, which I hope will precipitate interest and criticism, so that in the end a standardization of ophthalmic nomenclature may be obtained.

No classification is perfect; but in this instance the one that is based upon the embryo-histologic arrangement of the cornea, I believe can be best appreciated. Difference of opinion as to the etiology or origin of certain corneal diseases might cause minor changes.

In its final analysis, the subject is too broad for one mind, for several other items should be considered; as for example, the adoption of appropriate terms for the three main divisions—ulcerative, nonulcerative, and degenerative, and not the use of "keratitis" for all; and whether the terminology should be uniformly expressed in Latin or English. It might

not be out of place for me to suggest that an international committee be arranged to standardize the terminology for this and other ophthalmic subjects.

In explanation, I have attempted to arrange the corneal diseases according to the histology, beginning with the epithelial layer; citations of the literature, where the original article or a good abstract may be found; and a word concerning some obscure title, are given.

### A CLASSIFICATION OF CORNEAL AFFECTIONS.

- (a) Opacities of the Cornea.
- (b) Changes in Size, Curvature, Position and Form of the Cornea.
- (c) Nonulcerative Keratitis.
- (d) Ulcerative Keratitis.
- (e) Degeneration of the Cornea.
- (a) *Opacities of the Cornea.*
- Congenital Opacities.
  - 1. Visible nerves of cornea.
  - 2. Congenital scar formation (inflammatory or traumatic); Embryotoxon; Anomalies.
- Acquired Opacities.
  - 1. Inflammatory.
  - 2. Noninflammatory.

## 3. Traumatic.

(b) *Changes in Size, Curvature, Position and Form of Cornea.*

## 1. Microcorneal.

2. Ectasia—Staphyloma, Keratectasia, Keratoconus, Keratoglobus (megalocornea).

## 3. Vertically oval cornea.

(c) *Nonulcerative Keratitis.*

Pannus (syn. k. superficialis vasculosa; k. pannosa).

Types: *P. Phlyctenulosus* (syn. p. eczematous, scrofulosus, lymphaticus) *P. Lenticularis* (lentigo); *P. Fibrosis of Vernal Conjunctivitis*; *P. Herpetic*; *P. Leprosus*; *P. Trachomatous* (syn. k. trachomatous; k. pannitic—Theobald); stages—*P. tenuis*; *P. vasculosus*; *P. crassus*; *P. carnosus*; *P. sarcomatous*; *P. siccus*; *P. rebelis*; *P. follicularis*; *P. granulosis*.Keratitis Punctata Superficialis—Fuchs (syn.) k. subepithelialis centralis—Adler; k. maculosus—Reuss; k. Bombay—Herbert's disease; k. tropical punctate—Westhoff's and Kirkpatrick's disease (Elliott); k. punctata subepithelialis—Gradle; k. nummular—Stellwag; k. herpetic; k. sand-blast—Fox; Allied types *Keratitis Superficial Linear*—Spicer (syn. k. alphabet or k. büchstaben—Haab) *Keratitis Diffusa Superficialis* and *Keratitis Superficialis Catarrhalis*—Myashita; *Keratitis Flame-shape Marginal Epithelial*—Spicer; *Keratitis Marginalis Periodica Fugax*—Attias.

Keratitis Marginalis Vesiculosa—Gradle.

Keratitis Neuropathic. Types, "*Del-len*"—Fuchs; *Gaule's pits*; *Keratitis Herpetic*; *Keratitis Neuroparalytica*.

Keratitis Parenchymatosa (syn. k. interstitial; k. diffuse interstitial; k. diffusa; corneitis scrofulosa—McKenzie; k. syphilitica et scrofulosa; k. strumous; k. syphilitica; k. specific; k. inherited; anterior uveitis; k. profunda).

Allied Types: *Keratitis Punctata Syphilitica* (syn. k. punctata profunda; k. interstitialis punctiformis specifica—Hock; k. punctata vera—Mauthner); *Keratitis Gummata*—Re (syn. k. nodular—Wicherkiwicz); *Keratitis Interstitialis Centralis Annularis*—Vossius; *K. Secondary Parenchymatous*—Elsch-nig; *Gummatous Infiltration of Cornea*—Elschnig; *Salmon Patch*—Hutchinson (syn. k. vasculosa profunda; k. deep vascular; k. marginalis vasculosa; k. vascular interstitial); *K. Anaphylactic*—Wessely.

Sclerosing Keratitis—von Graefe (syn. sclero-keratitis).

Keratitis Profunda—Arlt. (syn. central parenchymatous infiltration; k. parenchymatosa circumscripta).

Keratitis Disciformis (syn. k. annularis et disciformis—Fuchs; k. disc-like; abscessus corneae; abscessus siccus).

Keratitis Marginalis Profunda—Fuchs.

Keratitis Pustuliformis Profunda—Fuchs.

Keratitis from Special Causes. k. frigore; k. cocain; k. toxic; k. fetal; k. congenital; k. malarial; k. dental; k. pyorrheal; k. diabetic; k. dysenteric; k. gonorrheal; k. inoculation; k. antityphoid vaccini; k. syphilitic or luetic; k. nasal; k. rheumatic; k. oyster-shucker; k. professional or occupational; k. tuberculous; k. leprous; k. nodosa; k. trypanosome; keratosis corneae; psoriasis corneae; k. wasp-sting; k. melanite—Perrin; pemphigus corneae; k. emetin; k. myxedema—Collins; k. naphthalin—Casper; k. punctata onchocerca—Luna.

Ill chosen terms commonly used to describe a condition—not an infection. Keratitis Striata (syn. streifen keratitis; k. striped; striate opacity; fädenförmige—Schirmer; traumatic lattice-form opacity—Casper; k. traumatic).

Keratitis Punctata (syn. "K P"; mutton fat deposits; descemetitis; keratite pointille; k. postica—Noyes).

(d) *Ulcerative Keratitis.*Erosion of Corneal Epithelium. Types: *Relapsing Erosion of Cornea* (syn. k. relapsing traumatic; k. erosion; k. recurrent or relapsing; k. traumatic exfoliating; detachment of corneal epithelium; ulcer corneae superficiales; traumatic keratalgia—Arlt; k. relapsing bullous—Nettleship; k. Nagel (k. fingernail—Hensen); *Keratitis Filamentosa* (syn. fädchenkeratitis—Leber; k. filiformis; k. threadlike).

Keratitis e Lagophthalmo—von Graefe

(syn. k. desiccation; k. xerotica—Feur; degenerescence cirreuse—Gallemaerts).

Ulcer of Pannus Trachomatosus.

Phlyctenular Ulcer (syn. kerato-conjunctivitis; k. lymphaticus; k. pustulosa; k. strumous; k. tuberculous; k. scrofulous; k. marginal phlyctenular; photophobia infantum—Fox).

Types: *Keratitis Eczematous*; *Keratitis Fascicularis* (syn. vascular fascicular; k. vasculosa; k. tenulosa; k. frenular; k. snail-track).

Neuropathic Ulcers. Types, *Herpetic Ulcers* (syn. k. herpetica; k. vesicular; k. stellata). (1) Herpes Corneae Neuralgica—Schmidt-Rimpler; (2) Herpes Corneae Febrilis—Horner; (3) Herpes Corneae Zoster (syn. zona ophthalmica); *Keratitis Dendritica*—Horner (syn. dendriform ulcers—Grout; k. dendritica ex ulcerans mycotica—Emmett; k. malarial—Kipp; k. furrow—Schmidt-Rimpler; k. arborescens; k. dumb-bell—Buxton; keratite ulcèreuse en sillon étoilée); *Keratitis Neuroparalytica* (syn. k. trophic; k. neuropathic; k. exposure; k. anæsthetica; desiccation neuritis).

Marginal ulcers. Types: *Infected Marginal Ulcer*—Zur Nedden; *Small Marginal Ulcer* (senile)—Fuchs; *Marginal Ulcers from Conjunctivitis*; *Marginal Ring Ulcer* (syn. circular ulcer, annular ulcer, k. ulcerativa marginalis—Martin; k. groove); *Marginal Phlyctenular Keratitis*; *Keratitis Marginalis Superficialis*—Fuchs.

Ulcers from Skin Diseases: variola, vaccine, varicella, acne rosacea (syn. k. rosacea; rosacea ocularis—Troncoso); erythema multiform, pemphigus and leprosy.

Ulcus Rodens (syn. ulcer Moorens; creeping ulcer; chronic serpiginous ulcer—Nettleship; k. chronic nonpurulent).

Simple Traumatic Ulcer.

Ulcus Serpens—Saemisch (syn. k. hypopyon—Roser; hypopyon ulcer; onyx; Saemisch ulcer; abscess of cornea—Arlt; pneumococcus ulcer; k. purulenta; acute serpiginous ulcer; k. suppurativa profunda; serpent ulcer; sloughing ulcer; creeping ulcer; septic ulcer; progressive ulcer; necrotic corneal abscess; torpid purulent infiltration of cornea—

von Graefe), Allied types: *Keratitis Atypical Hypopyon* (syn. atypical ulcer serpens of diplobacillary origin—McNab).

Ring (annular) Abscess of Cornea—Fuchs (syn. annular infiltration of cornea).

Keratomalacia—von Graefe (syn. k. xerotica; necrosis corneae; infantile corneal ulceration; exhaustion ulcer; xerosis of corneal epithelium; marasmic ulcer; xerophthalmic keratomalacia. Allied type: *Marantic Ulcer*.

Internal Corneal Ulcer—von Hippel (syn. k. internal).

Ulcers from Special Causes. Tuberculous ulcers; k. actinomycosis; gonorrheal ulcer; k. aspergillus; keratomycosis aspergilliana (schimmelpilz k.); k. malaria; k. exanthematous; k. variola; k. varicella; k. erysipelas; k. postvaccine; k. amenorrhea; k. traumatic; k. marble-workers; k. oyster-shuckers; k. farmers (harvesters or reapers); k. diplobacillary; k. pneumococcus; k. b. pyocyaneus; scabs of cornea; mustard gas purulent ring infiltration—Mayou; sphincteralgic ulcer—Morax.

(e) *Degenerations of the Cornea.*

(1) Pannus Degenerativus.

(2) Fatty Degeneration—*Arcus Senilis* (gerontoxon); *Senile Marginal Atrophy* (syn. peripheral furrow keratitis—Schmidt-Rimpler; chronic peripheral sulcus ulcer; marginal sclerosis; dystrophie marginale symétrique).

(3) Hyalin Degeneration—*Nodular Opacity*—Groenouw (syn. guttate opacity—Fuchs; k. guttate; drüsen formation of Bowman's membrane—Roemer). *Lattice Shaped Opacities*—Haab (syn. k. grill-like; k. gittrige; k. gitterförmige; grate-like opacity or k. pannel-like; k. trellis; k. reticulate or reticular; tessellated opacity; corrugation of Bowman's membrane—Byers; keratite quadrille). *Family Punctate Cornea Degeneration*—Fehr. (syn. interstitial punctate opacity—Gunn).

(4) Calcareous Degeneration—*Zonular Opacity*—Fuchs (syn. k. calcareous; ribbon-shaped opacity; k. ribbon; k. ribbon-like; calcareous bands of cornea; k. trophica; k. band; k. band-shaped; k.

bandoletta; k. en bandolettes; k. en bandes; k. bandolet; k. bandförmige—von Graefe; transverse corneal film; k. petrificans—Suker; girdle-shaped corneal clouding—Arlt; symmetrical opacity—Clarke; calcification of Bowman's membrane—Roemer; k. trophic—Magnus). *Progressive Interstitial Calcareous Degeneration*—Axenfeld.

(5) Vesicular Degeneration. *K. Vesiculosa et Bullosa* (syn. k. cullosa).

(6) Hyalin, Amyloid, and Calcareous Degeneration in Corneal Scars. *Atheromatous Ulcers*—Fuchs (syn. sequestrating scar keratitis—Wintersteiner).

(7) Dystrophies (Keratitis Avascular) *Dystrophie Epithelialis Corneae*—Fuchs.

(8) Blood-staining of Cornea.

(9) Peripheral Pigmentation of Cornea.

(10) Keratosis and Xerosis Corneae.

## REFERENCES.

In the general classification, the headings "a," "b," "c," are largely taken from Axenfeld's *Lehrbuch* (chapter by Elschnig) and elaborated.

*Pannus lenticularis* (lentigo) Amer. Ency. Ophth., p. 9229.

*Pannus fibrosis of vernal conjunctivitis*, indicating the superficial opacity usually seen in the upper corneal limbus.

Stages of pannus; Parsons Pathology, vol. 1, p. 197, and Amer. Ency. Ophth., p. 9229.

*K. punctata superficialis*—Fuchs; Wien. klin. Woch., 1889. Allied to herpes febrilis corneae without vesicles.

*K. subepithelialis centralis*—Adler; similar to above, Cent. f. Aug., xiii, 1889.

*K. maculosa*—Reuss; similar, Wien. klin. Woch., 1889; Parsons Pathology, p. 202.

*K. Bombay*—Herbert; Ophthalmoscope, Jan., 1904.

Westhoff's and Kirkpatrick's disease (named by Elliot); Tropical Ophthalmology, 1920, p. 321.

*K. punctata subepithelialis*—Gradle; Arch. of Ophth., Sept., 1911.

*K. nummular*—Stellwag; similar, Wien. klin. Woch., 1889; Parsons Pathology, p. 202.

*K. sand blast*, a synonymous term used in Fox's text book, 1904.

*K. superficial linear*—Spicer; Ophthalmoscope, March, 1916.

*K. alphabet* (buchstaben)—Haab; identical with above, Beit. zur Augenheil., June, 1916.

*K. diffusa* and *catarrhalis*—Myashita; abs. Oph. Y. B. xv, p. 69.

*K. flame-shaped marginal epithelial*—Spicer; Tr. O. S. U. K. xxxii 1, p. 386. A superficial, gray, raised, flame-shaped opacity, starting at the limbus and reaching more than one-third across the cornea. Fluorescein slightly stains. The patient was a cook, and heat was thought to be a factor.

*K. marginalis periodica fugax*—Attias; Archivo di Ottalmol. xxi 1, 1913. A most unusual opacity is described as forming in the upper part of the superficial layers of the cornea. Beginning with a nebulous area, it later developed into a band 2 mm. within and parallel with the limbus for one-third its circumference. There was a superficial vascularity over the opacity. Attacks occurred for many years in the Spring at intervals of 15 to 25 days and lasting for 24 to 36 hours. There was pain and redness with diminished sensitivity after the attack. It is probably allied to some of the types described under *k. punctata superficialis*.

*K. vesiculosa marginalis*—Gradle; A. J. O., iii, p. 519. The formation of a succession of large subepithelial vesicles near the limbus with subsequently an annular opacity beneath, ultimately involving two-thirds of its depth, is the substance of this unusual picture. The disease was bilateral, the beginning stage being represented in the right eye and the terminal stage in the left eye, with a dense opacity in the lower part of the cornea. It was the author's opinion that the vesicular contents absorbed and the uniform opacity beneath the vesicle was due to the toxins therein contained. The process repeats itself and the opacity increases in size. Cause undetermined.

Dellen—Fuchs; text book, a superficial corneal pitting 1x3 mm., probably a disturbance of innervation.

Gaule's pits; Arch. f. Oph. lxxviii, p. 82, 1911, similar to above but smaller, centrally placed and pass away within a few hours.

*K. neuroparalytica* (nonulcerative), occurring in lesions of the Gasserian ganglion.

Anterior uveitis; Duane's, Fuchs' text book.

*K. punctata syphilitica*; Fuchs' text book.

*K. punctata profunda*—Fuch; Fuchs' text book; this term is suggested for the above.

*K. interstitialis punctiformis specifica*—Hoch; de Schweinitz' text book, 1920, p. 272.

*K. punctata vera*—Mauthner; de Schweinitz' text book, 1920, p. 272.

*K. gummatosa*—Re; abs. Oph. Y. B. ix, p. 146. A case 27 years after infection, with areas of infiltration with yellowish nodules projecting into anterior chamber.

*K. nodular*—Wicheriewicz; abs. Oph. Y. B., 1906, p. 94. Described as a condition between *k. punctata* and *k. gummatosa*, usually seen in children who possess syphilitic stigmata.

- K. interstitialis centralis annularis—Vossius; abs. Amer. Ency. Ophth., p. 6762.
- K. secondary parenchymatous—Elschnig; Axenfeld's Lehrbuch, 1920, p. 457, a monocular affection occurring secondary to iridocyclitis.
- Gummatous infiltration of cornea—Elschnig; Axenfeld's Lehrbuch, 1920, p. 457. Occurring in connection with gumma of sclera and ciliary body, with a sector shaped area of deep corneal infiltration.
- Salmon patch—Hutchinson; de Schweinitz' text book, 1920, p. 267.
- K. anaphylactic—Wessely; abs. Amer. Ency. Ophth., p. 339, p. 6759.
- Sclerosing k.—von Graefe; Parsons Pathology, p. 202.
- K. profunda; Duane's Fuchs' text book, 1919, p. 299.
- K. disciformis—Fuchs; text book, 1919, p. 276. K. M. f. A., xxxix, 1891. This disease is usually classified with ulcer serpens on account of its similar origin, that is an injury to the corneal epithelium. Inasmuch as there is rarely if ever a loss of corneal substance, and on account of its similarity to keratitis profunda, the classification is changed to the nonulcerative forms.
- K. marginalis profunda—Fuchs; Duane's Fuchs' text book, 1919, p. 302.
- K. pustuliformis profunda—Fuchs; Duane's Fuchs' text book, 1919, p. 302.
- K. trypanosome; de Schweinitz and Woods, Tr. A. O. S., xv, p. 107.
- Keratoses cornea—Matsuoka, Nippon Gank. Zasshi. Aug., 1917.
- K. wasp-sting—Yoshida; abs. A. J. O., iii, p. 493.
- K. melanite—Perrin; La Clinique Ophth., Sept., 1919, a milky corneal infiltration occurring eight months after exposure to fumes of melanite. Recovery complete on withdrawal.
- K. emetin—Trantas; Ann. d'Ocul., clvii, p. 444.
- K. myxedema—Collins; Tr. O. S. U. K., xxvii, p. 203.
- K. naphthalin—Caspar; Klin. Mon. f. Augenh., lix, 142.
- K. punctata onchocercosa—Luna; A. J. O., i, p. 122, ii, p. 293, a superficial punctate keratitis due to activities of onchocerca volvulus, a filaria form nematode occurring in West Central America.
- K. punctata—Sichel; Parsons Pathology, p. 349.
- Mutton fat deposits—a term commonly used by English ophthalmologists to describe large precipitates on the posterior corneal surface.
- Fädenförmige (thread like)—Schirmer; Parsons Pathology, p. 182: allied types of striate keratitis are seen in the anterior layers caused by a wrinkling of Bowman's membrane in phthisic eyes, and are usually classified as reticular keratitis.
- Traumatic lattice-form opacity—Caspar; Klin. Mon. f. Augenh., 1903, p. 289.
- K. postica—a term used in Noyes text book in connection with k. punctata.
- Traumatic keratalgia—Arlt; MacNab, "Ulcerations of Cornea," p. 19.
- K. relapsing bullous—Nettleship, text book, p. 131, due to superficial injury.
- K. nagel (fingernail)—Hensen; MacNab, "Ulcerations of Cornea," p. 19.
- K. filamentosa—Leber; B. d. o. G. Heidleberg, 1882. Parsons Pathology, p. 183.
- Degenerescence circuse—Gallemaerts; abs. A. J. O., iii, p. 538, a variety of k. lagophthalmus with a parchment like rolling of the corneal epithelium in the exposed palpebral fissure.
- Photophobia infantum—a term used in Fox's text book, 1904.
- K. eczematosus; often used synonymously with k. phlyctenulosus; but since all cases of k. phlyctenulosus are not necessarily of eczematous origin, k. eczematosus should have a definite heading.
- K. frenal (snailtrack); Amer. Ency. Ophth., p. 6813, an irregular formation of phlyctenules.
- K. tenulosa, Amer. Ency. Ophth., p. 6817, an obsolete term for k. phlyctenulosus.
- Herpes corneae neuralgica—Schmidt-Rimpler; Weeks' text book, p. 286, accompanying the pain of a supraorbital neuralgia. Elschnig (Axenfeld's Lehrbuch, p. 433) likewise mentions herpes corneae due to focal infections in the teeth and sinuses.
- Herpes cornea frebrilis—Horner, 1871; A vesicular keratitis occurring in herpes facialis.
- Zona ophthalmica, Amer. Ency. Ophth., vol. vii, a synonymous term with herpes zoster ophthalmica.
- K. dendritica—Horner, 1871, described a vesicular keratitis associated with facial herpes, 1884, named by Hensen.
- Keratitis dendritica et ulcerans mycotica—Emmett; abs. Amer. Ency. Ophth., p. 3347.
- K. malarial—Kipp.
- K. furrow—Schmidt-Rimpler.
- K. dumb-bell—Buxton; Ophthalmology, xiii, p. 450.
- Keratite ulceruse en sillons étoilés, a synonymous term for dendriform ulcer used in de Schweinitz' text book, 1916, p. 250.
- Infected marginal ulcer—zur Nedden; Axenfeld (MacNab) "Bacteriology of Eye," p. 3.
- Small marginal ulcer (senile)—Fuchs; text book, 1919, p. 25.
- Marginal ring ulcer, mentioned in de Schweinitz' text book, 1920, p. 250.
- K. ulcerativa marginalis—Martin, W. A.; Amer. Ency. Ophth., p. 6822.
- Marginal phlyctenular keratitis, de Schweinitz' text book, 1920, p. 242.

- K. marginalis superficialis*—Fuchs; Duane's Fuchs' text book, 1919, p. 260.  
*Rosacea ocularis*—Troncoso, Arch. of Oph., xlvii, p. 1.  
*Ulcus rodens*—Mooren.  
 Chronic serpiginous ulcer—Nettleship.  
*Ulcus serpens*—Saemisch, 1870.  
*K. hypopyon*—Roser, 1856.  
*Onyx*, an obsolete term applied to an accumulation of pus between the layers of the cornea from an ulcer.  
 Abscess of cornea—Arlt.  
*K. atypical hypopyon and atypical ulcer serpens*—MacNab; "Ulceration of Cornea," p. 77 and 104.  
 Ring abscess of cornea—Fuchs, Arch. f. Augen. lvi, p. 1, abs. Oph. Y. B., 1904, p. 82.  
*Keratomalacia*—von Graefe.  
 Marantic ulcer, mentioned in Duane's Fuchs' text book, 1919, p. 261.  
 Internal corneal ulcer—von Hippel; Arch. f. Augen. lxxviii, 1908, abs. Amer. Ency. Ophth., p. 3380, a destruction of Descemet's membrane from corneal or iritic disease.  
 Mustard gas purulent ring infiltration—Mayou; Tr. O. S. U. K., xxxviii, p. 148.  
 Sphincterulic ulcer—Morax; Bull. de la Soc. Franç. d'Oph., 1911, a name applied to a superficial ulceration with persistent pupillary contraction not yielding to atropin. Iridectomy relieves pain and cures ulcer.  
*Pannus degenerativus*—Baas; K. Mon. f. Augen., xxxvii, 1900; Parsons Pathology, p. 196; occurring in degenerated, blind eyes such as result from cyclitis, glaucoma, etc.  
 Senile marginal atrophy—Fuchs; Duane's Fuchs' text book, allied to arcus senilis in that it always occurs in those cases.  
 Peripheral furrow keratitis—Schmidt-Rimpler, and Dystrophic marginale symmetrique—Terrien, are synonymous terms with the above, and are described in detail in Parsons Pathology, p. 248.  
 Nodular opacity—Groenouw; Parsons Pathology, p. 245.  
 Guttate opacity—Fuchs; Duane's Fuchs' text book, 1919, p. 312.  
 Drüsen formation of Bowman's membrane—Roemer's Lehrbuch, 1919.  
 Lattice-shaped opacity (gitterige k.)—Haab; Parsons Pathology, p. 247.  
 Corrugation of Bowman's membrane—Byers; A. J. O., iii, p. 716.  
 Family punctate degeneration—Fehr; abs. Amer. Ency. Ophth., p. 3364.  
 Interstitial punctate opacity—Gunn.  
 Calcareous degeneration—Dixon, 1848. Various names subsequently given, see Parsons Pathology, p. 243.  
 Zonular opacity—Fuchs.  
 Progressive interstitial calcareous degeneration—Axenfeld; abs. B. J. O. vi, p. 64.  
*K. vesiculosa et bullosa*—Fuchs; Duane's Fuchs' text book.  
*K. bullosa*, a term used by Meyer, text book; the older writers used the word pemphigus for bulla.  
 Atheromatous ulcers—Fuchs; Duane's Fuchs' text book; ulcers developing in old corneal cicatrices.  
 Sequestering scar k.—Wintersteiner; synonymous with the above.  
 Dystrophie epithelialis corneae—Fuchs; Duane's Fuchs' text book, 1919, p. 261.  
 Peripheral pigmentation of cornea; Axenfeld's Lehrbuch, 1920.

## DESTRUCTIVE TUBERCULOSIS IN THE EYE OF A CHILD.

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This case of obscure ocular disease destroyed the function of the eye and led to enucleation. The pathologic examinations demonstrated the tuberculous character of the lesions. Read before the Colorado Congress, July, 1921.

Acute tuberculosis occurring in the eye of a child so young (four years) is extremely rare. It is said to occur more often between the age of five and twenty-five, (de Schweinitz) the average age being twelve years.

The case reported began as an iritis or iridocyclitis, later involved the sclera and cornea, taking on a confluent or conglomerate form, and resulting in rapid destruction of the eye in a comparatively short period of time, some seven weeks from its onset.

**CASE.** David H. age 4 years, American, was first seen on June 6, 1921. The following history was obtained. His mother stated that she first noticed a redness of the right eye, about three weeks before, which she attributed to a "cold." There had been no injury to the eye and no secretion had been noticed. He had not complained of pain or discomfort, and had not been ill. He is the youngest of four boys, and has always been healthy; has had no illness. The family history is negative. Both parents living and well and no history of T. B. on either side is obtainable. Physical examination by the family physician was reported negative; and no enlarged tonsils or cervical glands were noted.

Examination revealed a moderately congested right eyeball, more marked in the ciliary zone. The cornea was clear, anterior chamber deep and the aqueous somewhat cloudy. The iris appeared dark brown in color (the left iris being light blue). The pupil was contracted, fixed and irregular, with a grayish white exudate in the pupillary area. The tension was normal and there was no bulbar tenderness. Vision was reduced to hand movements. The left eye was normal.

On June 8th Dr. Ward Burdick, who examined the blood, reported a negative Wassermann. The spinal fluid was not

taken. The von Pirquet skin test for T. B. was pronounced "mildly positive." Instillations of atropin had no effect whatsoever on the adhesions.

The patient was seen frequently during the succeeding ten days, during which time several small grayish white deposits appeared in the stroma of the iris near the pupillary margin, and small blood vessels were seen running thru it. The anterior chamber became more shallow, the cornea infiltrated and uniformly hazy without vascularity. At the end of three weeks the sclera near the limbus on the nasal side became bluish in color, and an ectasia 3 to 4 mm. in width involving the nasal half of the sclera presented. The tension was now recorded as minus. During this time the patient did not complain of pain or discomfort and except for a slight languor was apparently quite well.

As the eye was rapidly becoming destroyed, its removal was strongly advised, but consent was not obtained until July 6th, when enucleation was done.

Report submitted by Dr. Philip Hillkowitz, Pathologist at Mercy Hospital:

**Naked eye appearance.** "Right eye, ectasia at limbus involving inner half of globe."

**"Microscopic examination:** "Sections thru iris show on either side of the stratum pigmentosum a band of tissue, in which are seen many tubercles with characteristic giant cells of the Langhans' type, epithelioid cells and small round cells, as well as foci of caseation necrosis. Diagnosis: Tuberculosis."

**Report of Dr. Wm. C. Finnoff:**

After removal, the eye was fixed in formalin solution.

**Macroscopic appearance:** The submitted specimen had been cut meridionally and a large V-shaped piece of cornea removed. The remaining cornea was pushed forward by a collar like ectasia

in the region of the limbus. This portion of the eye was markedly thickened. A yellowish white exudate rested on the anterior surface of the iris, and almost completely filled the anterior chamber. The lens was not present. The retina was detached from the choroid. This probably occurred during fixation and opening of the globe.

Time did not permit of proper embedding of the globe, and only half of the eye was sectioned. This corresponded to the portion from which the cornea had been removed to prepare frozen sections. Celloidin embedding and staining with hematoxylin and eosin.

Microscopic findings: The anterior portion of the section, corresponding to the region just posterior to the limbus, is made up of a mass of lymphocytes, endothelial cells, giant cells of the Langhans' type, serous exudate, and necrotic material. This is covered externally by a thin layer of subconjunctival tissue, which contains conjunctival vessels. The mass is 3 mm. in thickness. In this area, the sclera has been replaced by a granulomatous mass, and no trace of scleral bundles can be found. The circular and radial muscle bundles of the ciliary body are entirely destroyed, and only phantom processes of the ciliary body are seen in the center of the mass. These consist of a wavy line of pigment granules, which are left in the wake of pigment epithelium, which has degenerated. Internal to the line of pigment granules, a cyclitic membrane has invaded the vitreous. This mass is typically granulomatous, and con-

tains giant cells and necrotic material. The cyclitic mass extends backward, almost to the ora serrata. A thin layer of broken down scleral bundles, corresponding to the external layer, is first noted opposite the posterior 1/4 of the corona ciliaris. Here the bundles are separated by cellular exudate and giant cells. Opposite the beginning of the orbicular ciliaris, the sclera is of a normal thickness and is not involved. Ciliary epithelial cells are first seen opposite the posterior 1/4 of the corona ciliaris. At the ora serrata, the retina is invaded by a few small round cells. The vitreous in this region contains fibrin and scattered endothelial cells. The endothelial cells are gathered in clumps, varying from 2 to 5 or 6 cells in thickness, on the inner surface of the retina, in the region of the peripheral retinal blood vessels. The nerve fiber and ganglion cell layers of the retina are slightly edematous. The retina was partially detached antemortem, as is indicated by a thin layer of fibrin and newly proliferated epithelial cells, which contain a few pigment granules. The layers of the choroid are widely separated by a serous exudate in its anterior half. This is especially marked in the outer portion, where the suprachoroidal space is distended to a marked degree. The optic nerve, cornea, and iris are not included in the sections cut.

Time did not permit staining for tubercle bacilli.

Diagnosis: Tuberculosis of the ciliary body, with extension thru the globe.

## ASTHENOPIA WITH TUBERCULOSIS.

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This paper contains an analysis of 184 cases in tuberculous exsoldiers. It gives the relative frequency of the different symptoms with practical points bearing on the clinical management of these cases. Read before the Colorado Congress, July 30, 1921.

The term asthenopia is derived from the word "asthenia," meaning a general debility or depression of vital power, weakness, or lack of resistance. The Greek word *sthenos* means strength while *asthenos* means, of course, the reverse of strength, or weakness, while the ending of the word "opia" relates to the eye. Thus we have "Asthenopia," meaning weakness of the eyes, not disease; and this I want to limit further to asthenopia in the tuberculous, and still further to asthenopic symptoms as shown in 180 tuberculous soldiers, who have been referred to me, complaining of their eyes, and in four young women, all between the ages of 20 and 35, in whom a positive diagnosis of pulmonary tuberculosis had been made. The longest definitely known time that any of these patients had tuberculosis is three years.

All were refracted under homatropin hydrobromat and painstaking retinoscopy done. This was checked in every instance at the trial case and in each instance a postmydriatic refraction was done after the accommodation was fully restored to normal—this restoration usually required 48 hours. I want to say here that refraction in young adults and especially in the tuberculous without a mydriatic is useless in most cases, no matter how carefully it is done, and the oculist is wasting his and the patient's time when it is done any other way. Many of these cases had been previously refracted without a mydriatic. In only one case of the 184 was the strength of the cylinder changed, and I am not sure I was right in changing that. In only 2 cases was the strength of the spherical correction decreased more than one quarter of a diopter, and in these two the decrease was only a half diopter. I tell you this to impress how much more reliable is a refraction carefully done under a mydriatic than when the patient's manifest refraction is relied upon.

The tubercular patient is greatly dependent on his eyes for contentment, and a contented tuberculous patient stands the best chances of recovery. I might say he is more dependent on his eyes than on any other organ, because if a tuberculous patient can use his eyes with comfort, more of his time is spent in reading, study, or occupational therapy, which will take up his time and prevent hours of the introspection so detrimental to this class of patients.

When an exsoldier with tuberculosis is referred to me for an examination of the eyes, I could almost write out his symptoms before he has told me of any of them, hand him the list and he would make very few corrections. Nearly all of them complain of blurred vision for sustained close work, the eyes tiring very easily on use for a short time, the time varying from five minutes to half an hour. This is accompanied or followed by headaches and pain in the eyes. A smaller percent complain of photophobia, lacrimation, and epiphora.

In the March issue of the *AMERICAN JOURNAL OF OPHTHALMOLOGY*, page 218, Dr. Edward Jackson has written an editorial which is so appropriate to the subject in question, that I take the liberty to quote liberally from it. In the first place he gives MacKenzie's definition of asthenopia as "that state of vision in which the eyes are unable to sustain continued exercise upon near objects", without other evidence of disease, and tells us that many cases were removed from this class by Donders' observations regarding hyperopia, astigmatia, and presbyopia. Jackson further says: "It may now be held to include only those unable to use their eyes for more than a very brief time without pain, altho the eyes are without recognizable ocular conditions to account for this disability."

If we confine asthenopia to those cases in which no cause can be found for the

symptoms complained of, there would be only a few cases of true asthenopia left in this series. I think Donders is wrong in this. I would agree with him if he would include those low refractive errors which, in normal health, produce no symptoms; but which, as soon as the subject comes down with some asthenic conditions, manifest themselves. And this is exactly what does happen in tuberculous subjects whose whole system is affected by the toxins of tuberculosis, which infection may have been going on for years. In these cases reported to you to-day the time of known inrection has been from 2 to 36 months; yet in some, if not all, the disease must have existed for a much longer time—probably years before going into service.

Jackson says: "The importance of asthenopia has frequently been forced upon the writer by the extreme cases that occur among patients suffering from pulmonary tuberculosis, involving lesions of considerable extent; but generally with rather good systemic resistance. Such patients sometimes have marked errors of refraction, and sometimes very slight ones; but no evidence of ocular disease. In either case they complain of very slight inaccuracy in their correcting glasses, and appreciate some diminution of suffering from slight rectification of their lenses. But they never get anything like complete relief from their pain and disability, and under the best possible conditions cannot use their eyes anything like so much as they wish. With recovery from the tuberculosis, they become free from asthenopia, and may discard glasses on which they were before entirely dependent." I do not agree with Dr. Jackson in his statement that, "They never get anything like complete relief from their pain and disability"; but I do agree in the main that "under the best possible conditions they cannot use their eyes anything like so much as they wish." All but one of the cases tabulated got relief from their symptoms. That one's complaint was, that before he was refracted telegraph poles and corners of buildings and rooms slanted to the right. He had a refractive error which required for the right eye

$+0.50 \text{ C. Ax. } 35^\circ$  and for the left eye  $+0.25 \text{ C. Ax. } 140^\circ$ . With these he complained that things "tilted" just as much as before; but the opposite way. I then changed the cylinder axis and finally got him to the point where he said there was only  $1/8$  of an inch difference between the upper and lower edges of a book and this bothered him. I then got Jackson's article on asthenopia and read to him the following after which, appealing to his intellect, he had no further trouble.

"A good intellectual appreciation of the essential basis of asthenopia, and the difficulties of removing it, should be followed by a frank discussion of the situation with the patient. These patients have generally been disappointed so often that they are not much disturbed by the lack of any promise of quick and easy relief; and nothing but the patient's intelligent, persistent cooperation, in living and working along the lines indicated for his or her particular case can ever effect a cure."

I will discuss the asthenopic symptoms of my series in order of their frequency.

First. 86, or 48.6 per cent, had hyperopic astigmatia. The astigmatic error was in the large majority of cases very small, being  $+0.25$  or  $+0.50 \text{ D. S. } \text{C. Ax. } 90^\circ$  or  $+0.50 \text{ C. Ax. usually } 90^\circ$ . Those cases requiring a high hyperopic or myopic astigmatic correction are not included in the series. It is very plain to me that these low errors manifest themselves and produce symptoms in patients when they succumb to some asthenic condition involving every part of the body, like pulmonary tuberculosis, while the same error may have existed for years without any discomfort as long as the patient was in ordinary health.

Second. 48.3% had muscle imbalance. There was either esophoria, exophoria or hyperphoria. In no case was diplopia complained of, and with one or two exceptions the muscle imbalance was well within what may be considered normal for distance, viz. one or two degrees. In no case was a prism prescribed. In a few cases muscle exercises were given. Personally, I am opposed to prisms, except in cases of hyper- or hypophoria.

These cases, as a rule, should be corrected by suitable prisms, base up or down as the case may require. Needless to say, the smallest error of refraction was corrected by lenses in these cases. In many cases no muscle imbalance could be detected after the correction was put on and in two cases the muscular error was increased.

The third symptom in order of frequency was frontal headache. If headache was taken as a whole, it would stand first on the list, there having been a total of 102 cases where some kind of headache was an important symptom; but I have preferred to divide headaches into frontal, temporal and occipital and find, 78 frontal, 12 temporal, and 12 occipital. These frontal headaches were carefully examined with reference to the relation that any accessory sinus involvement might have to the pain; but only in ten of the cases was an accessory sinus found involved. In these ten, there was tenderness on pressure over Ewing's point.

Please allow me to say, in parenthesis, that no comprehensive investigation of headache is complete without a thorough investigation of the nasal accessory sinuses and those of you who are interested in this particular subject will find Sluder's book on "Headache and Eye Disorders of Nasal Origin" of inestimable value.

Fourth, Sixty seven, or 36.4% of these tubercular patients, complained of blurring vision for close work. Acute vision is the ability of the eye to observe the shape, form, color, and size of an object. The clearest image of an object is obtained when a person looks directly at it. The rays of light then fall on the retina at the macula lutea. The acuity of vision is tested both for distance and for the near point. This blurring is nothing more than the relaxation of a weak, overworked, tired ciliary muscle after a concentrated effort to produce the clearest image possible. In hyperopes the ciliary muscles is usually very much more highly developed than in myopic eyes, and in these hyperopes of mild degree we more often find distress from blurring vision than in the myopes, who have not been accustomed to sharp and

distinct impressions. The stronger ciliary muscle of the hypermetrope takes on the same debility encountered elsewhere in tuberculous patients and manifests the fatigue by blurred vision, just as the muscle of an arm or leg manifests itself in the sensation of being tired or in pain.

Fifth in frequency, is pain in the eyes—50 cases, 27.1%. As Jackson has pointed out, pain is not to be measured—"We have no common unit for suffering: No objective method of observing it except by the evident effects it produces on the sufferer." This pain is described as sharp or dull, constant or intermittent, stinging or burning. It is usually in the front of the eyes, occasionally "behind the eyes" and frequently "the eyeball pains" and "is sore to the touch." Sometimes the sensation of sand in the eyes is the only symptom which makes the patient seek the services of an oculist. In these latter cases the pain is usually of nasal origin. With none of these patients was the pain so great as to keep them awake. It most frequently come on after 10 to 30 minutes use of the eyes for close work, whether reading, painting, doing bead work or whatever required sustained effort upon near objects.

Sixth—Inflammation, 35 or 19%. This is most frequently seen as a mild conjunctivitis or congestion, which is made worse on use of the eyes for close work.

Seventh—Burning and itching was the chief complaint in 29, or 15.7%; but was usually associated with blurring of print, headache and epiphora.

Eighth—Epiphora, 11.9%, 22 cases.

Ninth—Photophobia, 9.2%, 17 cases.

Tenth—Tired feeling, 7.6%, 14 cases.

Eleventh, Simple hyperopia occurred in 13, or 7%.

Twelfth, Dizziness in 7, or 3.8%.

Thirteenth, Poor distant vision in 6, or 3.2%.

Fourteenth, Twitching of lids in 6, or 3.2%.

Fifteenth, Simple myopia in 2, or 1%.

Sixteenth, Hordeola 4, or 2.1%.

For many years I have urged among my colleagues, the careful refraction of all tubercular patients. In a paper last

year I briefly mentioned "The nontuberculous eye of the tuberculous patient." I said then, "The third heading of this subject is an uncharted sea so far as concerns any recorded observations of ophthalmologists."

It has been known for many years in a general way, that a patient's eyes should be made as nearly emmetropic as possible. Probably not more than 1% in health or disease are emmetropic. Many of the ametropic conditions are taken care of without headaches or other manifested symptoms, and the person goes thru life unconscious of an error of refraction. With others, however, a very small astigmatic error may be the cause of all sorts of asthenopic manifestations. Gould of Philadelphia goes so far as to say that eyestrain may even cause tuberculosis. While I do not feel justified at this time in making so bold a statement, yet I know that eyestrain causes many ills; and that the life of the bed-ridden tuberculous patient may be made much more comfortable if his eyes are in such condition that his time may be partly occupied by their use without conscious or unconscious strain. There can be no harm in reading in bed if the light is properly placed, the patient lying in the

proper position and the book on a suitable stand, so that the muscular effort of the arms holding the book does not exhaust the patient. Indeed a definite course of reading could be mapped out suited to the individual that would so engross him and occupy his time, that the mind building as well as physical building could go on at the same time. I have seen many porch patients lie day after day with a black cloth or shade over their eyes to shut out the bright sun light; when a turn of the bed, a pull of a curtain, amber glasses, or a correct refraction would convert them from sour, melancholy, depressed, introspective individuals to cheerful patients with a new lease on life.

In none of these 184 cases was any pathologic condition found to account for the symptoms. I have thought at times that there was to be found in eyes of these tuberculous patients a disproportion in the size of veins and arteries of the fundus—giving the impression that the veins are larger than they are in health; but a careful study and comparison has failed to convince me that the relative size is other than normal.

## OCULAR SYMPTOMS OF EPIDEMIC ENCEPHALITIS.

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The ocular symptoms of epidemic or lethargic encephalitis are of great importance. They are often loosely observed and poorly reported. Accurate reports of them are still needed. In the two cases here given, special attention has been devoted to their observation and recording. Read before the American Ophthalmological Society, June 15, 1921.

The ocular symptoms met in encephalitis are sufficiently striking to have attracted attention from the first. In the earlier reports of cases, frequently references can be found to ptosis, diplopia, so-called strabismus, and mydriasis, with an occasional note concerning the pupillary reactions, but very often the record is rather vague. Even in otherwise well worked out case reports, the writers too often have been content with indefinite statements as to the conditions of the muscles supplied by the third nerve, without making clear the exact branches involved and the degree of involvement of each. Yet the pareses and paralyzes of the ocular muscles met with in this disease present some curious features which seem to me to deserve careful study.

These features are brought out thus in Tilney and Howe's summary of the ocular findings: Rarely clearcut complete paralysis of any one oculomotor nerve. The paresis is usually partial and involves more than one, or only part of one neuromuscular group. Ptosis is the most common isolated ocular finding. The disturbances are very frequently bilateral. Unilateral or bilateral paralysis of accommodation, dissociated from pupillary involvement, may occur. The palsies frequently are not stationary, but may change from day to day. I would add to this that the change may be even more frequent. Lesions of the fundus are usually absent, but there may be a slight degree of papilledema.

It seems to me that for the purpose of gaining what assistance we can from the ocular symptoms in making the diagnosis of this disease, the clinical pictures presented need to be studied with reference to the grouping of the symptoms in the individual cases in which ocular symptoms are present. It seems pertinent to inquire whether the successive pareses of muscles supplied by the third

nerve do or do not follow any order, whether any one of these muscles is apt to suffer first, and whether any one of them is more likely to suffer a greater degree of paresis than the others. The onset of the paresis appears to be gradual in some muscles, sudden in others; the palsy of one muscle may be fleeting, while that of another, perhaps supplied by the same nerve, is comparatively stationary. Whether any constant relation between these peculiar facts can be discovered seems worth consideration. So do the relations of the pupillary reactions, and of the condition of the accommodation, to the other symptoms.

Dr. Holden has recently made a very valuable contribution to this subject in his masterly analysis of the ocular manifestations in 100 cases of this disease. No one can say that these cases were not carefully and accurately observed and recorded. As a statistical study of the frequency with which the optic disc, the levator palpebrae, the individual extrinsic muscles of the eyeball, the pupils, the accommodation, and the facial nerve are affected, nothing better could be asked. As a study of the possible explanations of the conditions observed, the paper is excellent. But there is lacking information as to the clinical grouping of these symptoms in the individuals affected which might act as a guide to the clinician, and help him to recognize the disease in an early stage. Yet the importance of such information is recognized in the final sentence, which reads: "Since the eye disturbances of encephalitis are sometimes of early onset, and then the most annoying of the patient's symptoms, the ophthalmologist may be the first physician to be consulted, and in times of epidemic he may from the symptoms alone, if lues can be excluded, make the diagnosis." Apropos of this, it may be remembered that in two of the

seven cases reported to this Society by Dr. Woods in 1919 the ocular symptoms were the first to appear.

Such a study as the one indicated above can be made profitably only after the symptoms presented in a great many cases have been accurately observed, recorded, and published. Reliable data must be accumulated first of all; and it is for the purpose of making a slight contribution to the collection of such data that I wish to record my observations in the two following cases.

The first case is that of a man, 46 years old. Dr. Fairfax Hall, who had the care of the patient, has kindly placed his notes at my disposal, and it has seemed wise to quote rather liberally from them. When first seen, January 19, 1921, the patient said that for four days he had been dizzy, unable to sleep, troubled with diplopia, and suffering a constant pain with exacerbations down the outside of his right arm. Some months before he had received a blow on the head which rendered him unconscious, and since then he had not perfectly regained his strength, consequently a progressive lesion in the brain resulting from that blow had to be excluded before a diagnosis of epidemic encephalitis could be made.

Large doses of bromid, chloral, and codein failed to give him any sleep the following night. In the morning his temperature was  $102^{\circ}$  F.; systolic blood pressure 140, diastolic 100; neck slightly stiff; pupils contracted; some reflexes diminished, others increased, others normal; no paralysis, but the right arm was weak, stiff, tremulous, and painful; the left eye turned in, but moved past the middle line in looking to the left. The left arm also was somewhat painful. Lumbar puncture showed a very slight increase in pressure; clear fluid; 4 cells per ccm., 100% lymphocytes, moderate increase in albumin, moderate amount of globulin, moderate reduction by Fehling's solution, negative Wassermann with both cholesterinized and plain alcoholic extract antigen. The white blood count was about 8000, 68% polynuclears, 25% lymphocytes, 4% mononuclears, 2% eosinophiles, 1% basophiles. Blood Wassermann negative. The urine con-

tained a faint trace of albumin and a few hyalin and small finely granular casts.

I saw the patient on the afternoon of the 22d. He seemed to be rational and willing to help, but sleepy. The sleepiness was ascribed to the large amount of hypnotics which had been administered. The pupils were very small, about the size ordinarily seen after instillation of pilocarpin, approximately 1 mm. in diameter. They reacted quickly tho slightly to light, but did not respond to accommodation. The left externus was paretic, but not paralyzed. The eye turned in distinctly while at rest, but when the patient looked to the extreme left, it would pass the middle line and then lag along more and more slowly to a point about midway between the median plane and the outer canthus. Both inferior recti were paralyzed, neither eye could turn down below the horizontal plane. This paralysis had appeared since the morning visit of Dr. Hall on the same day, as he had tested the rotation of the eyes at that time and observed both eyes to turn downward. The upward rotation of both eyes, the lateral movement of the right, and the inward movement of the left were normal. The patient had a myopia of 18 to 20 diopters, and was not inclined to open either eye widely until after he put on his correcting glasses; then a slight ptosis of the left upper lid was evident. Its margin was lower than that of the right, but did not encroach on the pupil. Thus there appeared to be a partial loss of function of the left abducens and, to a less degree, of the left levator palpebrae, with a total loss of function of both inferior recti, the appearance of which was sudden.

The response of the contracted pupils to homatropin seemed to be a little more prompt than usual. There was no haziness over the left retina or papilla, and the vessels seemed to be normal, except that they all bent at the margin of the papilla and then ran smoothly to the center, as tho either rising to the summit of an elevation or passing down the gradual incline of an excavation. No markings of the lamina cribrosa could be seen, while the vessels at the point where

they turned to enter the nerve seemed to me a trifle more distinct with a lens one diopter weaker than was needed to render the vessels in the retina clear. I do not pretend to be able to measure accurately with the ophthalmoscope slight differences of level in high myopia. Had the case been one of emmetropia or hypermetropia, a positive statement that the center of the disc was above the level of the surrounding retina would have been justified; but as the case was one of high myopia, and as there was no confirmatory haziness, I can only record the observation as made. The right papilla showed no such change in the courses of the vessels; the fundus appeared to be normal except for an ordinary myopic conus.

The next day the patient slept almost continuously and was somewhat irrational when aroused. The paresis of the ocular muscles had become more marked. The left eye had almost no power of movement except inward, while in the right the only muscle which seemed to function properly was the externus. The relative degrees of paresis of the individual muscles could not be determined. The skin was cyanosed. There was no paralysis of the muscles of the limbs, but the hands and arms were weak with a constant tremor which was increased by movement. A careful study of the reflexes showed some to be increased and others diminished in a confusing manner which suggested multiple lesions in the cortex, corpus striatum and nuclei. Any single progressive lesion referable to the blow on the head was excluded and the diagnosis of encephalitis made.

The patient lay in a lethargic state for five days and then began to recover. On the 28th his pupils were moderately dilated, reacted sluggishly to light, but not at all to accommodation. The movements of the eyeballs were limited in all directions except to the right.

On February 2d the ptosis was almost gone and all of the other extrinsic muscles appeared to have wholly regained their functions, with the exception of the left externus. The left eyeball no longer deviated, but its outward movement was

slightly restricted. The pupils were of medium size and reacted promptly to light, but not to accommodation. The general condition was improved. As convalescence progressed, the patient learned that he could not read with his glasses, as had been his habit; this difficulty gradually became less.

The myosis in this case may be ascribed reasonably to the large doses of hypnotics, including codein; but it may be susceptible of some other explanation as it does not appear to be uncommon in this disease. The pupils reacted to light promptly at all times, except when under the influence of homatropin, but at no time did they respond to accommodation. Convergence was present, for the eyes seemed to fix on the finger held near them, altho the pupils did not contract. Later the accommodation proved to be paralyzed. Several cases have been reported in which the pupils responded altho the accommodation was said to be paretic or paralyzed; this case differs as the loss of function was accompanied by the usual loss of pupillary response. Yet, as Dr. Holden has suggested to me, an absence of the pupillary response to convergence is not uncommon in high myopia.

The second patient was an Italian, 44 years old, admitted to the New Rochelle hospital February 28, 1921. He had been suffering fifteen days from dizziness, headache, and pain in the back of the neck. On admission he lay apparently asleep, responding when spoken to sharply, but dozing off again at once, not restless and seeming to have no pain. The intern noted that his pupils reacted to light and accommodation, and that his left upper lid drooped.

On March 4th there was a slight ptosis of the left upper lid, not encroaching on the pupil, and paresis of the left superior and inferior recti, causing the eye to lag behind when the patient looked either up or down, with all other movements of both eyes normal. The pupils were of normal size, reacting promptly to both light and accommodation. The patient was very restless and made much resistance to the examination.

The next day the ptosis of the left

upper lid was more marked, the paresis of the left superior and inferior recti was unchanged, but the left internus was totally paralyzed. The left eye stopped at the midplane when the patient looked to the right. The functions of the other muscles appeared to be intact. No pathologic change in the fundus.

On the following day the paralysis of the left internus and the pareses of the inferior and superior recti had completely disappeared, the movements of the eyes in all directions seemed to be normal, and the ptosis of the left upper lid was less.

Three days later there was no ptosis and no limitation of the movements of the eyeballs in any direction. The patient looked and felt much better. After an uninterrupted convalescence he was discharged from the hospital apparently well.

About ten days later he was readmitted with the history that since discharge he had had several fits of drowsiness. Several more days elapsed before I was again summoned. The patient was then awake, rational, apparently in good condition, with no signs of ocular trouble. The bedside notes showed that an inequality of the pupils and a ptosis had been noticed three days after readmission, both of which had quickly disappeared, and the nurse said that she had frequently observed a ptosis, which was sometimes partial, sometimes total, and disappeared in a short time. The occurrence of the ptosis seemed to her to be a precursor of an attack of drowsiness. Nothing else was noted about the eyes tho the patient gradually sank into a state of complete lethargy.

On April 16th he could not be roused, but lay apparently asleep with both eyes closed. When the lids were raised, the eyes were seen to be looking straight

forward, not turned upward as is usual in sleep, and not deviating in any direction. Whether this position was due to an absence of any paresis, or to total paralysis of all the muscles, could not be determined. The left cornea was much more sensitive than the right. A wisp of cotton drawn across the left cornea caused the patient to try hard to close the eye and to turn his head; when drawn across the right a much less effect was produced. The pupils were of medium size and responded by dilatation to pricking of the skin over the malar bone. There was little reaction to light.

On the following day the pupils were dilated, did not respond to light, and the dilatation was only slightly increased by pricking the skin over the malar bone. The right cornea was almost if not quite insensitive, while the left was clearly sensitive. Nothing abnormal was observed in the fundus. No further change was observed until the patient's death a few days later.

The very fleeting nature of all the ocular symptoms in this case is most striking. The observation of the nurse that the appearance of a ptosis seemed to be a precursor of an onset of drowsiness seems to me to be worthy of note. The other symptoms seem to have been of a like fleeting character, as they disappeared so completely, and the patient felt so well, that he was discharged from the hospital as cured of a disease which soon reasserted its presence and then went on to a fatal termination. Insensitiveness of the cornea may have been observed before, but if any record of the kind has come my way it has been overlooked. In this case it seemed to have been a late symptom, and its probable diagnostic value cannot be said to be great.

## MELANOSARCOMA OF THE CHOROID.

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This case was under observation eleven months before enucleation of the eye, and eight months afterward. The detailed report of pathologic examinations of the tumor is included. Read before the Memphis Society of Ophthalmology and Oto-Laryngology, September 13, 1921.

Mrs. J. W. W., first seen December 15, 1919, giving the following history: For past two years severe headaches. On the 9th, first noticed a spot on left eye and upon closing right eye could not see well out of left. No pain, and until this time she did not know the eye was giving trouble, altho previous history elicits the fact that a year ago last October she had a spell with her stomach, and during this time she noticed a white cloud before the left eye. As she expressed it, like seeing the tips of a wing of a pigeon.

*Examination.* R. Vision 20/200, corrected to 20/20 with a  $+3.50 \text{ } \ominus \text{ } +0.75$  cy. axis  $180^\circ$ . L. 5/200, corrected to 20/65—1 with a  $+3.50 \text{ } \ominus \text{ } +1$  cy. axis  $30^\circ$ . With the ophthalmoscope R. fundus normal. L., to upper nasal side, detachment of retina extending to edge of disc and one-half way towards temple region. Few vitreous opacities. Vision from temple and lower side of retina normal. Transillumination at this time, light reflex thru pupil without a shadow.

Diagnosis at this time, detachment of retina. Advised K. I. and rest, and on December 26, detachment seemed less. Vision the same. On March 16, about the same. On April 15, 1920, detachment seems a little lower over disc. Vision now unimproved by glasses. Fingers two feet only. July 7, again seen, no difference in detachment and vision now with a  $+4. \text{ } \ominus \text{ } +1$  cy. axis  $180^\circ$  equal 20/100 +.

Patient not seen again until November 9, 1920, at which time stated had been sick for the past three months, having been out of city. Vision now a questionable perception of light. Finger tension seemed slightly higher, altho with the Gradle tonometer it was twenty millimeters, and with McLean twenty-eight in both eyes, and can now see a distinct dark shadow typical

of a tumor. After consultation I advised enucleation. Was seen by Dr. Ellett, who agreed to the diagnosis and also advised enucleation.

On November 29, enucleation, from which patient made an uneventful recovery.

Last seen July 23, 1921, and has had no further trouble.

*Macroscopic.* Completely filling half of the posterior chamber of the eye is a roughly spherical tumor mass 11 mm. x 15 mm. x 12 mm. The tumor apparently originates from the equatorial zone of the choroid layer. The retina is completely detached and covers the tumor portion which pushes into the posterior chamber. The center of the tumor, which grossly appears solid, is a light grey in color with a peripheral zone which merges gradually from a sepia to a dark brown as the outer edge is reached. The pigmented zone, however, is well limited from the gray zone. It measures 1 mm. to 3 mm. in width. The lens is pressed forward so that the angles of the anterior chamber are blocked. The cornea is turbid. There is no gross infiltration by tumor of the sclera. A colloid like material appears to have detached the remainder of the retina from the posterior chamber wall, so that the retinal layers of both sides of the fundus lie parallel to one another in a line extending between the lens and the optic nerve.

*Microscopic.* The tumor is a uveal tract tumor arising from the choroid. It is made up entirely of uniform sized round and polymorphous cells 7 to 10 microns in diameter; the nuclei are round, small, and well stained and are surrounded by a rather dense cytoplasm which stains well. Teased specimens were not examined; the cells, cut in various planes, all appear uniform in shape and size.

The cells are arranged in a suggestion of cords and columns with no gland like lumina. Separating the columns is a very delicate connective tissue stroma. Sparsely distributed between these cell columns in the connective tissue reticulum are blood spaces appearing often as clefts lined by endothelium, which in turn is frequently bounded directly by tumor cells.

The greater portion of the tumor is unpigmented. The peripheral zone, however, is deeply pigmented. This pigment shades off gradually in amount as the central portion of the tumor is approached. The pigment in the lighter areas appears as delicate granules located in the cytoplasm of the tumor cell. In the peripheral portions, the pigment is so dense that the

granular form is lost and the individual cell structure is blotted out. No chromatophores, differing morphologically from the tumor cells, are seen.

There are no multinucleated nor giant cells. The tumor appears to be of relatively slow growth; no mitotic figures are found. There are no areas of necrosis; no cholesterol crystals. There are no specific degenerative changes; no hemorrhage, no calcification. The iron reaction is absent.

Lying between choroid and the detached retina or portions of the fundus not occupied by a tumor, is a colloid like material, probably a product of choroid secretion.

*Diagnosis.* Melanosarcoma of choroid of eye. I am indebted to Dr. W. H. Burmeister of Chicago for the findings in this case.

### MELBOMIAN SEBORRHEA.

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BUFFALO, N. Y.

Abnormal conditions of the Meibomian secretion are here classified. The pathologic alterations of the glands and lids attending them are described. An unusual case is reported in detail and other cases cited in the literature. A bibliography related to the subject is appended.

If a tarsal cartilage is pressed, as between two fingers, a secretion usually exudes from the mouth of each Meibomian gland. Normally this is a minute, clear, oily, droplet; best seen with the aid of a loupe. In numerous individuals the secretion is abnormal in quantity and character. Many lids will show the secretion from the majority of the glands normal, while that from a few will be definitely abnormal. When this is the case, the abnormal glands will usually be near one or the other canthus.

There are three quite distinct types of altered secretion. These types are definitely marked and for convenience of reference are called "A", "B", and "C" respectively. "C" is the most often seen. "A" is next in frequency.

"A". A dirty white substances of a consistency similar to or somewhat thicker than that of cream cheese. This often exudes in the form of long

very thin threads, or as comparatively large masses, probably depending upon the size of the duct opening.

"B". A fluid resembling thin pus in color and consistency; no doubt a combination of "A" and "C".

"C". An oily fluid, clear or somewhat turbid and yellowish in color, which is expressed in an amount far exceeding normal.

The Meibomian are the largest sebaceous glands. They are identical in structure and character of secretion with the sebaceous glands of the skin.

Seborrhea is described as "a disease marked by a morbid and excessive discharge from the sebaceous glands." (Lippincott's Dictionary.) In seborrhea, "The mouths of the ducts of the sebaceous glands are more or less dilated, and from the dilated ducts slender filaments of sebaceous material can be readily expressed." (Hartzell's Text book.)

"Meibomian Seborrhoea" seems an appropriate name for the condition of altered secretion of the tarsal glands.

It is not uncommon to find glands from which it is impossible to express any secretion. It may occur in chronic conjunctivitis in which the whole lid is thickened. In chalazia it will frequently be found impossible to express anything from the particular glands involved. The question arises as to whether the chalazion is the result or the cause of the obstruction. Repeated expression will sometimes restore the secretion.

Of what interest clinically is Meibomian seborrhea? If examined for, it is frequently found. During the past two or three years many cases have been under more or less prolonged observation. I think it may be said quite positively that only rarely are symptoms produced. It is to be regretted that the study has yielded results that are negative rather than positive. However, I am of the opinion that there are at least three pathologic conditions with which altered secretion of the tarsal glands has a definite relationship exclusive of the case described below, which is probably unique.

First. A localized congestion and thickening of the tarsal conjunctiva, usually the outer or inner third of the lower lid. The area varies in size, is quite well delimited, and not infrequently shows papillary roughening. The symptoms are those of chronic conjunctivitis.

Second. A chronic conjunctivitis involving the tarsal conjunctiva especially of the lower lid, and producing a thickening of the whole lid, a wide intermarginal space and a rounding of the lid margin. This type of conjunctivitis is sometimes responsible for a refractory, mushy ulceration of the cornea.

Third. Chalazion. As noted above it is frequently impossible to express secretion from the glands involved. Repeated attempts will usually give success and may result in the disappearance of the tumor, if not too large. In those cases of multiple and recur-

ring chalazia, repeated expression will probably terminate the process.

During the past year or two, Dr. Charles Bentz has cultured the secretion from many cases with negative results.

Nothing is to be gained by citing cases illustrative of each of the above mentioned conditions. The conditions themselves are well enough known. Suffice it to say that treatment, aiming at improvement in the Meibomian secretion, has given gratifying results in a certain number of cases.

In addition to the usual methods employed, the treatment consists in thoro expression of the glands. Between the thumb nail of one hand and a finger nail of the other, this can be accomplished readily. It is well to precede it by cocain instillations. It should be repeated daily for a while and then at longer intervals, as recommended by Elschnig.<sup>5</sup> The following is a description of an exceptional case. It differs in several respects from any heretofore described.

S. J. F., an Austrian Hebrew, male, age 37, sewing machine worker. Family history negative, except that he states a sister is similarly afflicted. She lives in a distant city and this cannot be verified. Personal history negative except for a Neisser infection when a youth. Wassermann negative in two laboratories.

Present condition. For fifteen years there have been frequent periods of obstruction of vision due to the accumulation of a substance between the lids. This substance is carried over the cornea by the lid movements. If it remains upon the center of the cornea, as it often does, there is of course great interference with sight. This trouble was not preceded by any ocular disorder or other impairment of health, except that he remembers there was an eruption of his face which he describes as "pimples." There have been no signs of inflammation during this time. The condition has not only been the source of annoyance but has at times produced actual disability, causing him to lose positions because of

the effect on his vision. The accumulation is sometimes great enough to attract attention.

Examination shows one outstanding feature. There is a peculiar substance which moves up and down over the cornea with the lid movements. It may remain across the center over a period of several winking. The patient dislodges it by rubbing his eyes. It is grayish white and perhaps best described as a fine soapy foam, or a coarse emulsion, not at all resembling pus or mucus. It may cover half the cornea, tho generally it is left somewhat below the pupil, so that its interference with vision is perhaps the exception rather than the rule. It is to be noted particularly that the substance does not gather on the tarsal conjunctiva, nor in the culdesacs, nor on the bulbar conjunctiva except in the interpalpebral space. It is also to be especially noted that the lids are not thickened and the conjunctiva thruout presents a normal appearance. The tarsal glands are the source of this material, moderate expression causing to be exuded from all the glands large quantities of secretion described above as types "A" and "B." If thoroly expressed, the annoying symptoms disappear for a few days.

Treatment has given but temporary relief. Astringents and yellow oxid have been tried. Repeated expression has been employed; but owing to the patient's disinclination to submit, not nearly to the extent considered necessary.

His lids were exposed to the Roentgen ray five times ( $3/8$  of a unit each) by Dr. Grover Wende. This was discontinued contrary to the advice of Dr. Wende, who feels that a longer course of treatment would have given results. Would it be justifiable to split the tarsus and cauterize the wound as was done by Maklakoff<sup>3</sup> or to remove the tarsi as recommended by Reitsch.<sup>6</sup>

Dr. Chas. A. Bentz has very kindly examined the secretion and reports as follows: "The smears and cultures of the secretion expressed from the Meibomian gland of S. J. F., resulted as follows: The direct smears were cov-

ered with a fatty substance. It was necessary to treat the slides with alcohol and ether to remove the excess before staining and histologic examination. The examination showed the presence of considerable fatty secretion, occasional epithelial cells, and diphtheroid bacilli. The scale like substance removed from the conjunctiva contains the same organism and fatty like material.

Dextrose agar and blood agar were streaked with the material from the glands. After 24 hours incubation, colonies were fished and inoculated into Hiss litmus serum water medium, 1% dextrin, and 1% saccharose. Acid and coagulation appeared in the saccharose, but the dextrin remained unchanged. Guinea pigs inoculated with the filtrate from subcultures made in dextrose broth, using .2 c.c. per 100 grams body weight, show no pathologic results.

The direct smears, cultural results, and nonpathogenic properties, show the organism to be *B. xerosis*."

The ophthalmic text books do not touch upon the subject of alteration in the secretion of the tarsal glands, and a review of the literature reveals comparatively few references to the disorder. In an exhaustive treatment of the whole subject of diseases of the lids, including much experimental work, Cuenod<sup>1</sup> (1894) did not refer to this question of altered Meibomian secretion.

In 1894 J. A. Lydston<sup>2</sup> of Chicago described an inflammation of the conjunctiva which recurred coincidentally with the extrusion of sebaceous like material from the Meibomian glands. It was characterized by island shaped elevations between which was normal conjunctiva, resembling vernal catarrh. There was slight mucopurulent discharge. The retrotarsal folds were not affected. He could find no reference to a similar condition. He supposed the inflammation was excited by microbic or chemical irritation due to the Meibomian secretion. The process was controlled by cauterizing the palpebral edges with strong solution of silver nitrat.

In 1901 A. A. Maklakoff, Jr., of Moscow, reported a complete bacteriologic study of a case of purulent inflammation of the Meibomian glands which had existed for five years. The lids were markedly thickened, the lower being everted. Nodules the size of a pea were present. The Meibomian gland openings were dilated, it being possible to pass a Bowman probe number 2 into some of them, in one to the depth of 7 to 8 mm. The conjunctiva was hyperemic with swollen papillae. Gentle pressure on the tarsi caused yellowish pus to escape from the ducts. In the conjunctival sacs were yellow flocculi of mucus. All remaining parts of eyes were normal. Vision with each eye was 20/20. There was atrophic rhinitis with ozena. After several months of varied treatment without benefit, the margins of the lids were split so as to open freely the Meibomian glands. The wounds were curetted with a sharp spoon and cleansed with peroxid of hydrogen. This was repeated several times, and finally the thermocautery used to cauterize the wounds. This gave a satisfactory result. He could find no similar case in literature. The bacteriologic study showed the infection to have been due to the *Bacillus mucosus ozenae*.

In 1907 A. Natanson<sup>4</sup> of Moscow reported four cases of chronic multiple suppuration of the Meibomian glands. In one patient there were twenty or more foci of pus in the lids of one eye. Cultures in his second case showed the presence of *staphylococcus pyogenes aureus*. He called the condition Polyadenitis Meibomiana Chronica Suppurativa. There was no tendency to spontaneous evacuation of the pus, and it was remarkable that the conjunctiva was not inflamed.

A. Elschnig<sup>5</sup> in 1908 wrote that a chronic inflammation of the tarsal conjunctiva due to hypersecretion of the Meibomian glands was quite common. He states that up to that time a description of it had not appeared in literature. The culdesacs and bulbar conjunctiva are not usually affected. The lids are thickened and the inter-

marginal space reddened. The tarsal conjunctiva is thickened with a velvet like appearance due to hypertrophy of the papillae. The inflammation is more marked at or near the free border of the lids in contrast to nearly all other forms, in which the conjunctiva at the convex border of the tarsus is most intensely affected. On pressing the tarsi, large masses of pus like secretion come from the ducts. Examination shows it to be almost entirely fat, seldom mixed with cells. In the majority of cases no organisms can be found. Complete emptying of the Meibomian glands, frequently repeated in conjunction with astringents, has led to the cure of the conjunctivitis. It appears usually in people beyond forty years of age. He calls this condition "Conjunctivitis Meibomiana." Lydston<sup>2</sup> fourteen years previously adopted this name for the inflammation he described at that time.

In the case of Dr. W. Reitsch<sup>6</sup>, but one lid was affected. A complete bacteriologic study was made and pure cultures of the *Bacillus capsulatus mucosus* obtained. A section including the Meibomian glands showed small cell infiltration about the gland ducts. Large number of bacilli were found in the ducts, and yet the duct epithelium was practically intact. The same bacteria were obtained from the nasal mucus.

The case was a girl of ten. Her left lower lid had been inflamed and swollen at times during the five years preceding. Reitsch found the skin of the lid red and swollen and the intermarginal space widened. The Meibomian gland openings were red and elevated and pressure caused pus to escape from them. The culdesacs and bulbar conjunctiva were not involved. Reitsch refers to Natanson's<sup>4</sup> cases and considers them from the latter's description to be examples of the not uncommon hordeolum internum. Particular mention is made of the fact that in spite of the constant presence of great numbers of the bacilli, the Meibomian glands of the upper lid and the lacrimal passages were not infected. Vari-

ous treatments were employed, including zinc ionization and radium, but without effect. Reitsch concluded that extirpation of the tarsus was indicated, but he had not operated at the time of his report.

Dr. Julius Wolff<sup>7</sup> presented a case before the New York Academy of Medicine. There was hypersecretion of the Meibomian glands and all the lids were swollen, red, and nodular. There was pain and photophobia. Expression of the glands several times a week for four months resulted in marked improvement. In the course of the discussion, Dr. Weeks stated that he had seen a similar case in a girl of six.

Dr. G. Anselmi of Modena<sup>8</sup> accidentally came upon a case of apparent localized pigmentation of the tarsal conjunctiva. Histologic examination showed that instead of pigment deposit, the discoloration was due to a cystic formation of some Meibomian glands.

In 1918 K. Hiwatari<sup>9</sup> of Kagoshima, Japan, reported three cases which coincided with Elschnig's description. The secretion was nearly solid fat and was sterile. He thinks that daily expression is ineffective treatment.

Two years ago G. Pereyra<sup>10</sup> of Florence, reported three cases of ozena, in each of which there was a chronic conjunctivitis characterized by the presence of dark yellow plaques on the tarsal conjunctiva. Pressure caused to be discharged from the Meibomian ducts a yellowish viscous substance. The bacillus ozenae mucosus was found in this secretion, as well as in the nose, and he thought the conjunctival changes to be due to the infection of

the Meibomian glands with this organism.

All the cases reported and referred to above have many points of resemblance to each other. The altered secretion, the chronicity, the thickening of the lids and changed margin, the congestion and thickening of the tarsal conjunctiva, without involvement of the conjunctiva of the culdesacs or globe, the mucopurulent discharge, and the subjective symptoms dependent upon the inflammation characterized them all. They divide themselves into two groups by the character of the secretion. In the cases of Maklakoff, Reitsch, Pereya, and Natanson, the secretion is described as purulent. In those of Lydston, Elschnig, Wolff, and Hiwatari it was not pus but fat.

In my case the altered secretion is fat and not pus. It differs from all the others in important respects.

First: The only subjective symptom is the obscuration of vision, and this is purely mechanical.

Second: There is no inflammation whatever, notwithstanding the long duration of the disorder.

Third: There are no lid or conjunctival changes.

Fourth: The spontaneous evacuation of the secretion in such quantities as to obscure vision.

Conclusion. Many lids show altered Meibomian secretion. The cause of this alteration is not known. Bacteriologic examination shows the secretion to be usually sterile. Abnormal lid conditions probably arise from these changed secretions. The treatment is not entirely satisfactory. Further microscopic, bacteriologic, and possibly chemical study is needed.

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## CERTAIN APPEARANCES OBSERVED IN THE EYEGROUND OF THE TUBERCULOUS.

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The writer has observed a special fullness and tortuosity of the retinal vessels in patients suffering from tuberculosis, and those whose family history included cases of this disease. No heart lesions were present in these patients. Attention is called to these changes in the hope that they will be looked for by other ophthalmologists.

The condition to be described does not refer to the tubercles of the choroid usually seen in the last stages of tuberculosis, nor to the perivascular types with hemorrhages, so well described by Finoff,<sup>1</sup> nor to the exudative or conglomerate types; but to an anomalous distribution, multiplication and tortuosity of the retinal vessels, principally venous, but frequently arterial as well.

I have been watching these anomalies for twenty years, being astounded at the condition found in a fellow prac-

titioner of this city when refracting him. As he coughed frequently, expectorated moderately, and was noticeably dyspneic, I assumed the condition was due to undue fullness of his pulmonary venous system, thus producing the fullness and tortuosity of his retinal vessels. This patient is living, and in active practice, over fifty years of age, his lung condition having become stayed. He is, however, dyspneic. In sequence, I observed cases with similarly appearing eye grounds who were tuberculous, or

with stayed lesions, but who never had marked shortness of breath, which disproved the belief that the appearances of the retina, in the case mentioned, are due to undue fullness of the pulmonary circulation.

Other similar cases were observed year after year, until certain characteristics seemed to form an entity. At times I was impressed with these characteristics in apparently healthy young adults, and in children whose history showed them to be of tuberculous ancestry.

Yesterday, a patient consulted me whose retina showed great increase in the number of the retinal vessels with extreme tortuosity. In addition, there were seen knotty kinks of the small veins, convincing me that I should find high blood pressure and other evidences of such condition. Altho there are believed to be beginning changes of the vessel coats, I can find no distinct indentations where veins and arteries cross. This man is fifty years of age, in active business pursuits. He has been under the care of excellent internists for two years, whose investigations show that he has an abnormally low blood pressure, now 110; but before treatment it registered systolic 90, diastolic 65. Wassermann negative. Blood count normal. Low hemoglobin and normal conditions of the urine, excepting low specific gravity. The X-ray findings of his chest showed that, in the hiluses of the lungs, there is dense infiltration from a tuberculosis of former years, of which he had never been conscious.

This patient claims to have never had cough, hemoptysis, dyspnea or any other symptoms arousing any suspicion of tuberculosis. He has never had any severe or prolonged illness. He is an overworked, too strenuous business man, irritable and sleepless; symptoms accompanying arterial sclerosis.

During the seven years that I have recorded these retinal peculiarities, I find, sometimes, somewhat similar appearances in the constipated and those whose elimination is faulty.

Two cases of my earlier tabulation had these retinal peculiarities; both had been fast runners in their college days. One had paced; the other running two miles daily. One patient had hypertrophy of the heart. He claims he never had tuberculosis. The other patient's mother had, and was cured of tuberculosis by residing in Colorado. Both are physicians. Unfortunately I have no X-ray findings of these cases, which might be enlightening.

It has been very difficult in my active work to go back over this long period to search my files; yet this has been done, and I can cite several cases in confirmation. Only comparatively recently (seven years) have I inquired into patients' past histories when I find such conditions in the eyeground. Many times when negative replies are given, further inquiry discloses the fact that one or the other of the patient's parents have been tuberculous.

The causes of these conditions seemed unfathomable until I occasionally found similar conditions in patients lacking normal eliminative functions. Then Jackson's article on "Tuberculosis as a Focal Disease," awakened me to the belief that he had opened the nut and disclosed the rich kernel within. We have many instances of these so-called focal features in the tuberculous; headaches particularly, and the usual train of bad tongue, breath and indigestion. One of the great drawbacks to health in these patients is intestinal disfunction, and frequently these annoyances are relieved by an appendectomy. Is it possible that the toxins of tuberculosis and the deficiency in eliminating them, both in the predisposed and in those whose lesions are active or stayed, may explain the anomalous appearances described? We have alterations in the course and in the appearances and in the number of retinal vessels in polycythemia. Acquired tortuosity of the retinal vessels occurs also in leukemia. The appearances I describe are similar to the congenital tortuosity which Levin<sup>3</sup> attributes to "an insufficiency of elastic vascular fibers." The bending of the ves-

sels is chiefly in the lateral plane and not so much in the anteropendicular, coming under the description of inordinate physiologic or congenital tortuosity, as described by Beard.<sup>4</sup> No heart lesions have been present in the cases I describe as tuberculosis. There is yet to be considered the influence of the endocrin glands, of which much is still to be learned.

There is no difference noted in the eyeground appearance between those cases in the active or stayed stage of the disease, nor in those assumed to be due to hereditary influence. I have tabulated 325 cases from private practice. Of these:

13.23% are classed as possibly due to heredity.

36.31% are in cases of tuberculosis, active or stayed.

50.15% in cases showing the vascular condition, on which appearance this article is based, but of which no history is noted in case records and no cause can be obtained.

There are sure to be some of these latter cases who have had tuberculosis, known or unsuspected, but this cannot be proven without X-rays of their chests, which are obviously impossible to obtain; therefore the proportion of the real tubercular cases, under no circumstances, can be lessened. Better knowledge of many is more liable to increase the percentage of the tuberculous.

The fact that about one-half of the cases observed with this vascular retinal condition are in the individual whose lesions are active or stayed, or in who heredity is a vulnerable factor, certainly gives cause for thought. The writer practices in a section where he meets probably a larger proportion of these unfortunates than other regions might show, and he makes no claim other than for originality of observation. His effort is largely to bring these facts before his fellows so that they may aid him in making further observations.

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### DISCIFORM KERATITIS FOLLOWING SMALLPOX.

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Four cases are here reported. In three of them the corneal disease followed smallpox, and in two the eyes had to be removed. Read before the Colorado Congress, July, 1921.

"This is a keratitis that is allied to *ulcus serpens*, and consists in the development in the middle layers of the cornea of a gray disc-shaped opacity. In the center of the disc a small, more deeply clouded speck is commonly observed. The periphery of the disc is sharply delineated by a border of deeper gray, which in many cases, is made up of concentric lines." (Fuchs.) In these few words we have the essential visible characteristics that identify this form of keratitis. It runs a rather protracted course and the indications

for treatment may be complicated. Fuchs says, "only exceptionally a small loss of substance develops over a circumscribed area." In two of the following cases there was large loss of corneal substance, with loss of the eyes. Fox in his treatise on Ophthalmology says, "Treatment is of no avail in effecting a cure."

I wish to recount four cases I have seen; three of the cases following a few weeks after recovery from attacks of smallpox. The fourth followed a mild trauma to the cornea. In three

cases that I saw early, the characteristic visible signs of a disciform keratitis, the gray disc of infiltrate and white speck, did not appear for two weeks or more after the beginning of the inflammation.

CASE 1. A girl, 16 years old, was brought to me July 28. About two months before, she had had smallpox. The left eye had some pericorneal injection and the cornea had a dull appearance with no infiltration, and its surface was dull and rough looking. It looked like a parenchymatous keratitis and a tentative diagnosis of interstitial keratitis was made. Treatment with atropin and general medication was instituted. Salicylates were first given. For a time the eye seemed to do well, but after two weeks it grew worse and the characteristic white speck appeared in the cornea with the concentric gray rings and radiating lines. It gradually became aggravated with remissions until two-thirds of the cornea became waxy looking, as tho it consisted of a layer of pus beneath Bowman's membrane. Then the corneal surface began to break down in spots and finally one half melted away. The ulcerating area healed from the outer margins. The course of the keratitis was about two and a half months, the eye then developed secondary glaucoma and was removed the following March.

CASE 2. A widow, 33 years of age, came to me November 25, of the same year. In the cornea of the left eye, over the pupil, was a dense gray mass, 2 1/2 mm. to 3 mm. in diameter. The pupil was small and the eye injected, but not extremely so. She had been treating with an oculist in a neighboring city since July when the trouble began. She said the haziness appeared in the eye in July, and that she had had an attack of smallpox a month or more before. She had been visiting the oculist at intervals, and had worked a part of the time in an office. As she was apparently not suffering very much, I wished to test the iris to see if it were free, before doing a Saemisch incision. At the end of three days, as I could

not positively promise that my treatment would save the eye, she returned to the former oculist and had the eye removed.

CASE 3. My confrere in Independence asked me to take charge of one of his patients, a young man 20 years of age, while he was away on a vacation. I first saw the patient June 2 in the doctor's office and concurred in the probable diagnosis of interstitial keratitis. The patient was on mercury, and atropin locally. He came to my office June 4. At this time the corneal surface was rough and dull in appearance, with pericorneal injection. He returned June 6, with the picture of disciform keratitis well developed; a disc with sharply marked margin and a white speck near the center of the disc. The doctor tells me he first saw the patient May 22. The patient now told me that he had had smallpox about two months before the eye trouble began. I diagnosed pus in the white speck and urged him to go to the hospital and let me do a Saemisch incision. In the afternoon of June 8, I did a small Saemisch incision thru the disc and transversely thru the middle of the white speck. The white speck was approximately 1/2 mm. by 1 1/2 mm. in size. On making the incision, one-half of the white speck came away and the other half sloughed out the second day following. The wound closed promptly, and from the second day on I treated the eye once daily with dionin and atropin powder, equal parts. This powder was left in the eye five minutes, then flushed out and argyrol and atropin instilled. A light cover was then applied to the eye.

I should add that when the clinical signs of a disciform keratitis indicated the real nature of the trouble, the mercurial treatment was stopped and the patient was put on sodium salicylat. It was given in Gifford's prescription but a smaller dosage. The eye did well. The pain, which had been quite extreme, was relieved and the cornea cleared rapidly of the gray infiltration. By the end of the week the outline of the disc was still to be made out, but the gray infiltra-

tion had nearly all disappeared. As my confrere had returned, I sent the patient back to him with a full description of what I had done. I am told that treatment similar to that I had instituted was continued until August before the eye entirely quieted down.

CASE 4. This case is very interesting as we know how it came about, and it did not follow smallpox or any other general infection. A lady, 31 years of age, came to me April 4 of this year with an irregular branching ulcer of the cornea covering the pupillary area. There was a slight injection. She claimed she had not been sick recently nor had the eye been injured. The right eye had simply become irritated about a week before. It was not particularly painful, but her husband insisted that she should have something done for it. They lived nine miles from town. A tentative diagnosis of dendritic keratitis of undetermined cause was made. She was put on atropin and argyrol locally and salicylat internally. The expectant treatment was given, as the real cause of the keratitis was not clear. She was asked to return the second day.

She returned the third day, April 7, with a whitish gray ring of infiltration. She told me she recalled to mind that her little girl's straw hat had blown in her face, and the rim struck her in the eye on March 26. The eye had become irritated the next day, and had continued irritated ever since.

At this time there was no white speck nor radiating lines to be seen. A solution of dionin to be used twice daily was now added to the treatment. She returned the 8th, 10th, and 13th, with the eye much the same. On the 16th the eye did not appear so well, and on the 18th she returned with the typical visible signs of disciform keratitis well developed. The white speck was present and the radiating rays were very conspicuous.

As the weather was cold and rainy, I insisted she go to the hospital for treatment. She would not consent, and she did not return to me again.

Fuchs says: "The cause of the disease is an infection of the cornea from without, the central gray speck representing the point of entry of the bacteria." In Case 4 the superficial ulceration had entirely disappeared before the clinical signs of a disciform keratitis appeared. That the white speck is a mass of pus or necrotic tissue would seem proven from the finding in Case 3, and that the white speck is not the point of entry of bacteria but is situated in the substance of the cornea.

Whether the three cases following the smallpox developed from a slight superficial corneal injury, or whether they were due to endogenous infection I cannot decide. Cases 1 and 2 insisted the eyes had not been hurt but that the eye simply became inflamed. That from the superficial injury to the skin a mild or severe ulceration may develop, or an abscess in a deeper tissue may form, is well known. If this form of keratitis may develop from a slight superficial injury, or accommodative strain may bring on an iritis when the systemic condition of the patient is bad, why may not accommodative strain or a slight injury bring on the form of keratitis as in cases following smallpox?

In a review of an article by Dr. F. H. Verhoeff, in *Practical Medicine Series*, 1920, Vol. III, we find: "Certain cases of disciform keratitis are of the same nature as keratitis profunda. The corneal changes in keratitis profunda are due to the action of diffusible toxic substances arising near the anterior surface. The microscopic findings in the present case strongly indicate a neuropathic origin for keratitis profunda."

CONCLUSIONS. In these cases, we find that the characteristic signs of disciform keratitis may not appear for two weeks or more after the eye becomes inflamed.

There is a parenchymatous inflammation of the cornea with formation of an area of pus or necrotic tissue homologous to an abscess.

One should be very diligent in the treatment of trivial injuries of the cornea that do not heal promptly.

# NOTES, CASES AND INSTRUMENTS

## REMOVAL OF CINDER FROM ANTERIOR CHAMBER.

HUNTER W. SCARLETT, M.D.

PHILADELPHIA, PA.

On September 1, 1920, J. R. presented himself with the following history:

The day previously while walking along the street, during a violent wind storm, he suddenly felt a sharp pain in his right eye. It was so severe that he consulted his family physician, who attempted to remove a cinder which he said was in the eye. No relief was afforded at this time.

Examination the following day revealed an injected eyeball, with a small hazy spot on the cornea about 2 mm. in from the limbus, at 8 o'clock. This spot colored with a fluorescein. Just beneath it, lying on the anterior surface of the iris, was what appeared to be a small black spicule of cinder about 2 mm. in length, which moved with the iris on contraction and dilatation of the pupil.

A keratome incision was made at the limbus at about 7 o'clock. By means of a thin nontoothed forceps, the spicule was removed, after gently depressing the edge of the wound with a spatula.

The recovery was uneventful, and to date, one year after the accident, no evidence of cyst formation has appeared.

The question arises; did the sharp spicule penetrate the cornea and lodge on the anterior surface of the iris; or, did it chance to strike the cornea with its sharp edge, partially penetrate it, and was then pushed entirely thru by the efforts of the family physician to remove it? The latter view seems most probable.

## PERMANENT VASCULARIZATION FOLLOWING PARENCHYMATOUS KERATITIS.

ROBERT VON DER HEYDT, M.D.

CHICAGO.

Some decades ago Hirschberg drew attention to the permanently visible

vessel remnants in eyes which have suffered a parenchymatous keratitis.

These bristle like structures were accepted as being comparatively obliterated vessels. (Axenfeld text book.) It has remained for the Gullstrand slit lamp to disclose that their function as carriers of blood and blood plasma remains a permanent one.

Krueckow and Fuchs were the first to describe these vessels as being situated anatomically in the middle and posterior corneal layers. They are now disclosed as being exclusively situated in the deep parenchyma, in the form of parallel lines joining to form a very acute loop toward the corneal middle, when seen by stereoscopic microscopic examination in the living eye. They may be crossed by similar vessels within another adjacent layer, however, remaining parallel to one another when within the same layer. This parallelism within the same layer may be due to the peculiar structure of the parenchyma, which allows of a penetration along a line of least resistance, somewhat analogous to the development of the so-called Bowman's canaliculi, which latter form when air enters the corneal substance.

The veins are seen to be flat and quite large compared to the arteries, the circulation within them quite slow, consequently the latter may be easily observed, especially when the stroma above is comparatively free of infiltration. The individual corpuscles may be counted as they roll along.

Koeppel describes a visible pulsation, I have been able to see only a very rapid flow in the arterioles under a high magnification (61 times). There is a jerklike intermittent movement in the veins, which cannot physiologically be termed a pulsation.

Physiologists, among them Krogh and Hooker, have recently found that the normal capillaries may be without muscular coats, they may still exhibit active movement and take part in regulating their own diameter in response to the needs of the tissues which they supply.

Many capillaries may be so narrow at times that they permit no corpuscles to pass, yet allow of some circulation of plasma thru the tissues. This I have repeatedly confirmed by observation in the living cornea.

When the need of a certain supply of blood to the corneal tissue has once been established by an active pathologic process, such as a parenchymatous keratitis, it seems necessary for the parts thus altered always to have need of this supply for proper nutrition.

This phenomenon is well illustrated in many cases of keratitis that I have observed within the last year. These corneas show an active vascularization ten to twenty, and in one case forty-five years after the acute inflammatory process had subsided.

During the active stage of parenchymatous keratitis, the red tinge of the corneal stroma is in a great part seen to be due to an imbibition by the tissues of red corpuscles and their products of decomposition.

In May, 1921, I had under observation the case of a woman 54 years of age, in whom I discovered an active corneal vascularization. This was 45 years after quiescence of the inflammatory process. Her right eye showed about 25 deep seated vessels, of which all but half a dozen carried blood, only a few carried plasma. On induced hyperemia they all filled up.

I extracted a cataract from this eye three months ago, and have now a complete reestablishment of the circulation, including the upper half of the cornea, which necessarily was cut off from its supply by the incision. The persistence of this means of circulation and its reestablishment of function after this long drawn out deprivation of supply, has proven to me that the need of flowing blood for the nourishment of the pathologically altered stroma, now after nearly half of a century, may be construed almost a physiologic necessity.

From now on it may be accepted that all so-called Hirschberg vessels are

active blood carriers. They are not the remnants of former vascular activity, but blood vessels in a state of more or less passivity of function. The advent of the Gullstrand slit lamp has made their study possible in the living eye.

At one time von Michel suggested that one of the forms of parenchymatous processes in the cornea was caused by a nutritional disturbance due to the obliteration of some of the pericorneal vessels; that is, the conjunctival wreath of vessels at the limbus. Clausen recently advanced this belief. An obliteration of these vessels has just been disproven by Kunze, who made a most thorough anatomic examination of an active case of luetic keratitis. (*Graefes Arch. f. Ophth. Bd. 102. Aug., 1920*). Here again the slit lamp comes to our aid by disclosing a marked extension of this superficial wreath of vessels, loops and arcades toward the corneal middle in all cases of advanced keratitis. This advancement and increased vascularization is, however, not pathognomonic of parenchymatous keratitis but may also be seen in other cases of corneal disease, where a bulbar hyperemia has continued for a long period of time.

### A NEW TRIAL FRAME.

M. E. SMUKLER, M.D.

PHILADELPHIA, PA.

Attention is called to a new trial frame having the following features:

It is light and rigid, having no springs in its construction, except one in each temple.

It is very easily adjusted to the face and when adjusted it sets comfortably and snugly.

Each pupil is adjusted separately, and the frame may be tilted downward for the reading test.

The details of its construction may be understood from the accompanying drawings (page 37) which are made of actual size.

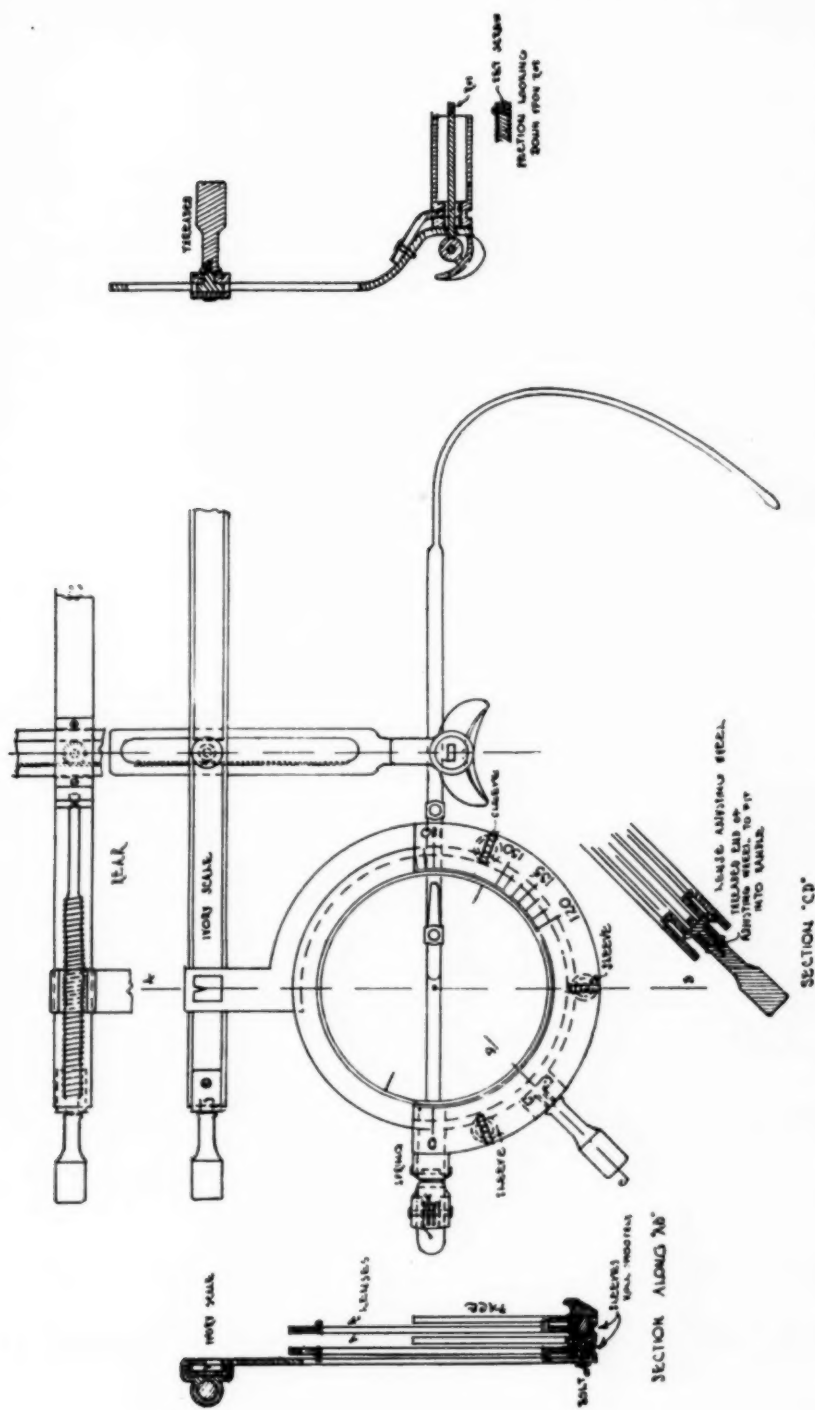


Diagram showing construction of trial frame as suggested by Dr. Smukler. Parts shown of actual size.

## A CASE OF SYMPATHETIC OPHTHALMIA.

CARL McCLELLAND, A.B., M.D., F.A.C.S.

DETROIT, MICHIGAN.

Read before the Detroit Ophthalmological and Otological Club, May, 1921.

O. W., farmer, age 25 years, came to me August, 1920, complaining of soreness and loss of vision in the left eye. Three days before, while working with a coal chisel, a chip of steel had struck his left eyeball. He thought nothing of the injury at the time, and continued working until his eye became so painful that he had to consult a specialist. He had been treated by his family physician, who thought there was nothing in the eye.

Examination in my office showed, vision in the right eye, 20/20; left eye, light perception only, was intensely inflamed, cornea cloudy, pupil small and irregular, and the anterior chamber showed a beginning hypopyon. There was a small wound in the sclera at the scleral margin, at the region of six o'clock. Iris was prolapsed into the wound. The giant magnet was used for diagnostic purposes, and caused great pain, when the eye was brought in the field of the magnet. He was referred immediately for X-ray. The report showed a foreign body approximately three millimeters long, two millimeters wide and one millimeter thick, well forward in the anterior quadrant of the eye, lodged in the ciliary body. This was removed at the hospital the following morning, with very little difficulty, by inserting the small tip of the magnet between the lips of the wound in the sclera.

On account of the length of time since the accident, the position of the steel in the eye, the amount of infection and reaction that had occurred and the loss of vision in the eye, the patient was advised to have the eyeball removed in order to avoid sympathetic inflammation in the right eye. This did not meet with the approval of the patient or his uncle, who is a physician. He remained in the hospital four days, during which time the

infection rapidly subsided, but there was still considerable iritis in the injured eye, when he was discharged. The right eye was perfectly quiet and vision normal.

The patient was not seen again for six weeks. Examination, at this time showed acute ciliary congestion and tenderness in the right eye, vision of less than 20/200, pupil contracted. The left eye was practically free from inflammation. The patient said that injured eye had been quiet and comfortable for two weeks. Believing that we had a beginning sympathetic disease in the uninjured eye, he was immediately sent to the hospital, and the injured eye was enucleated the next morning.

Patient was referred to Dr. C. E. Vreeland for thoro physical examination, and to have X-ray for any involvement of his teeth. The right lower molar was found to have an abscess at its root, and it was extracted. Dr. Vreeland found a history of chronic constipation and intestinal disturbance, which he corrected with diet. This treatment together with the usual atropin and hot compresses, also huge doses of sodium salicylat, one grain per pound body weight, was given daily. His condition improved and he left the hospital in nine days. Vision in the right eye was 20/100, cornea clear, very few K.P. deposits, vitreous somewhat cloudy, but rapidly clearing.

At this time, he was shown at the Detroit Ophthalmological and Otological club. It was the opinion of all who saw him, that the prognosis was very good. The uveitis was subsiding, and unless complications arose, he should get good results and good vision.

Three weeks later the patient returned. He told me that his eye had cleared up and vision was good, but because of the pressing need of work on the farm, he had driven a tractor a few days, also an automobile for a neighbor, from dark until daylight. After he had rested about six hours, he again drove the car all night, and he had caught cold. His eye became

very sore, with great decrease in the amount of vision.

Examination showed, that he had only light perception, and there was much more involvement in the uveal tract than there had been at any time since the inflammation started. He was advised to come into the hospital, which he did in January, 1921. Further examination showed that pupil was fixed with adhesions, atropin caused practically no dilatation, cornea was clear, details of fundus could not be made out. The patient's general condition was bad, appetite poor, bowels irregular, moved only when a cathartic was taken, and he was greatly depressed mentally. Dr. Vreeland was again called, and Dr. Harold Wilson saw the patient with me.

The condition of the eye, at this time was very unfavorable. On account of his stomach and bowel condition, it was thought inadvisable to start the sodium salicylat treatment again; in fact, any medication by mouth seemed to be out of the question, as he was unable to retain it. After discussing the case with Dr. Frothingham, it was finally decided to use hypodermic injections of milk. Laboratory examination at this time showed the urine normal. Blood showed five million reds, 8,750 whites, 70% polynuclear and about 20% mononuclear. Wassermann negative.

On January 24, 5 cc. of milk which had previously been brought to boiling point, was injected into the gluteus muscle. There was practically no reaction to the injection, except the blood. The white count rose to 13,750, there was no relief from pain in the eye, nor was there any change in its appearance. In

five days 5 cc. of milk was again injected. This time the white count rose to 15,500. There was no general reaction. A third injection was given in five days, the white cell count this time rose to 16,750. A new interne on service made the injection, and the patient got a gluteal abscess, which had to be opened and drained. This ended the milk injections, and he refused further treatment in this line. While we did get the reaction in the blood picture, which is considered necessary in order to have a favorable result from the milk injections, yet so far as I could see we got absolutely no reaction upon the eye. We tried the sodium salicylat again for a few days, while he could take it. It quieted the pain in the eye and made him more comfortable, when it had to be discontinued because of his stomach symptoms.

The patient left the hospital February 17, 1921. The eye was still very much inflamed. The vision practically the same as when he came in, light perception only. I have heard that his condition remains unchanged.

This case represents a number of interesting points: 1. Location of steel in the "danger zone" of the eye. 2. There was severe infection and hypopyon present. 3. Three days had elapsed since the accident. 4. Patient had distinct evidences of other foci of infection, viz, apical abscess in one tooth, chronic constipation. However, the removal of these did not seem to have any effect upon the progress of the disease. 5. Injections of milk proved ineffectual; in fact nothing seemed to have any lasting effect in arresting the progress of this severe infection.

## SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly the important scientific papers and discussions.

### PITTSBURGH OPHTHALMOLOGICAL SOCIETY.

November 7, 1921.

DR. E. B. HECKEL, President.

#### Traumatic Dislocation and Absorption of Lens.

DR. EDWARD STIEREN presented a case of traumatic dislocation of the

stained but sufficiently transparent to allow a globular body fixed in the anterior lower vitreous chamber to be detected.

Under myotics the pupil contracted and the tension became normal. Potassium iodid was given internally, and the vitreous cleared sufficiently to enable one to identify the globular body



Markel's case of tumor near pituitary body. Front view of patient and side view

lens into the vitreous in a high myope, followed by absorption of the lens. The 29 year old patient stated, Aug. 29, 1921, that the left eye had been struck with a baseball a week before. At first examination the pupil was dilated ad maximum; the anterior chamber obliterated; the tension 36 mm., McLean. The patient was a high myope, his correction being—12 S. in each eye. The vitreous was blood-

in the vitreous as the crystalline lens. As the lens remained stationary, it is presumed that the lower suspensory ligament remained attached to the lens capsule and anchored it in the position in which it was first noted. The lens has gradually become smaller by absorption, until at the present time there is practically nothing remaining but the lens capsule. With —3 D. S., the vision is now 6/60 and gradually im-

proving. The vitreous still remains somewhat cloudy.

### Tumor Near Pituitary Body.

DR. J. CLYDE MARKEL reported a case of tumor in the vicinity of the pituitary body. The patient was Mrs. W. N., colored, aged 28, with negative family and personal history, until about six years ago, she suddenly had an attack of momentary blindness and

gan to fail gradually, accompanied by some pain in the eye and head. Saw a local doctor at the time, who told her she needed glasses, but none were got until recently, when she obtained a pair of -5.00 spheres for constant use. These were not comfortable and were not worn.

She came to the dispensary on account of failing vision in the right eye.

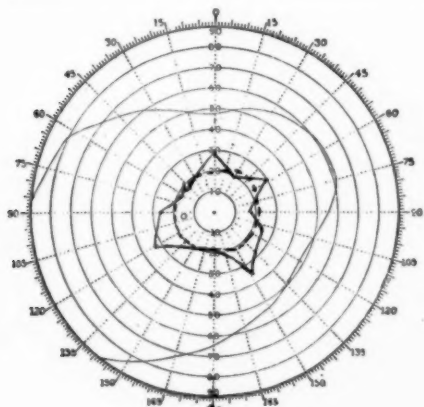


Fig. 3.

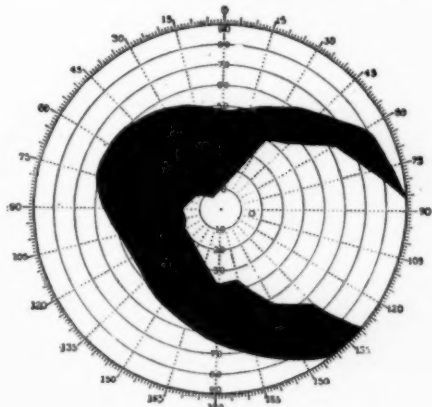


Fig. 4.

Fields of vision of Markel's case. Fig. 3, left eye. Fig. 4, right eye. In Fig. 3 the solid line indicates boundary of the field for red; the broken line boundary of the field for green

dizziness and lost consciousness. This attack was of short duration and was the only one she had ever had. She is about 6 feet tall, and weighed 155 pounds. Her general appearance is shown in Figs. 1 and 2. Her memory is poor. She does the usual amount of house work daily without any unusual fatigue, tho at times gets short of breath and heart palpitates on any unusual exertion.

Bowels regular, no constipation, no unusual appetite for sugar or candy. Skin normal. Has lost several molars, has several bad teeth, no pyorrhea. No anosmia or gustatory interference. Blood Wassermann negative.

Eight years ago, a small soft tumor mass appeared on the second toe of each foot; these were painful on pressure, necessitating the splitting of her shoes to obtain comfort. Four years ago, a mass the size of a marble appeared on the lobe of the left ear. Four years ago, vision in right eye be-

Vision R. 3/200, eccentric; L. 20/20? Has marked proptosis of both eyes, more marked in the right. Partial ptosis of the right lid.

Scarcely any movement in the right lower lid. When the eyes are closed, the lower does not meet the upper in the right by about 6 mm., and in the left by 3 mm. On forced closure, left lids meet, but right are separated by 3 mm. Von Graefe sign not present. Right eye diverges up and out. There is a paresis of the internal recti of both eyes, and of the inferior rectus of the right. Pupils equal, react to light, accommodation and consensually, also when light is thrown on the temporal half of the retina of R., giving Wernicke's hemiopic reaction.

Ophthalmoscopic examination shows media clear. Discs slightly oval, pale white, atrophy more marked in right eye. Fields: R. almost the entire nasal field obliterated, with no color perception. L. normal for form, with

some interlacing of red and green. See Figs. 3 and 4.

The X-ray examination of Mrs. M. W. reveals evidence of a tumor springing from the region of the sella turcica, and deviating slightly to the right of the median line of the skull. As seen in the lateral view, it is approximately 32 mm. in width, at its greatest diameter at the base, and 27 mm. at its greatest width at the apex. Its greatest length is approximately 46 mm. Its greatest lateral diameter, as seen in the anteroposterior view, is approximately 38 mm. It is of irregular outline and apparently has calculus like deposits scattered thruout. The landmarks of the sella turcica are practically obliterated by the tumor.

*Discussion.* DR. STIEREN stated that from the appearance of the shadow in the radiogram examined by him, he was inclined to the view that the lesion is a cyst, on account of the limiting membrane present. The proptosis is also due to a similar condition. The tumor mass no doubt arises from the posterior part of the pituitary body. That there have been no localizing symptoms developed is due to the slow growth of the lesion. He suggested radiographic examination in different positions to determine if gravity would make any change in the shape or localization of the mass.

DR. HECKEL suggested excision of the tumors on the ears and toes of the patient to determine their pathologic nature. He is of the opinion that the cerebral tumor is not a neurofibroma.

DR. KREBS stated that in a case of pituitary cyst which was operated intranasally, the fluid never ceased dripping and the patient died three weeks after operation.

#### **Fluid Vitreous and Cataract Extraction.**

DR. S. L. KOCH reported a case of fluid vitreous complicating cataract extraction. The combined operation was done up to the completion of the capsulotomy. The lens could not be tilted, and vitreous of the consistency of thin oil presented. The operation was discontinued; the eye has healed and re-

mains quiet after three weeks. Light perception and projection are good.

*Discussion.* DR. STIEREN advised transfixion of the edge of the lens with Fisher's needle inserted from the temporal side of the corneal section. Pressure forward on the cornea, he believed, would deliver the lens with inconsequential loss of vitreous.

DR. HECKEL advocated a new corneal section well within the clear cornea. Pressure above would cause the corneal flap to override the upper edge of the lens, which would be anchored and permit of delivery from pressure below.

G. H. SHUMAN,  
Secretary.

#### **COLORADO OPHTHALMOLOGICAL SOCIETY.**

October 15, 1921.

DR. F. R. SPENCER presiding.

#### **Traumatic Irideremia.**

E. T. BOYD, Denver, presented a man aged twenty eight years whose right eye had been struck with great force by the chain of a chain pulley. When the patient was seen one hour after the injury, the eye was bleeding freely, and there was a long string of tissue lying on the cheek. After cleansing, this was found to be iris tissue leading to a wound one cm. long in the cornea, at the upper part of the limbus. Blood clot, iris, and vitreous presented in the wound. The anterior chamber was full of blood. Dr. Boyd cut away the iris and the bead of vitreous. After absorption of the blood in the anterior chamber, it was apparent that absolutely no iris tissue remained except a small tag engaged in the wound. There had also been rupture of the zonula and of the capsule of the lens just below the site of the external injury. At the time of presentation all lens matter had been absorbed, but there was a dense capsular membrane in the center and above. A fine outline of the capsule of the lens could be seen clearly except above. The vision was that of moving objects only.

*Discussion.* E. R. NEEPER, Colorado Springs, had seen only one similar case. The child had seemed to suffer less annoyance than one would have expected; and when the case was seen again some years later, there was very fair vision and the eye was comfortable.

D. H. COOVER, Denver, some years ago saw a similar case due to a blow from a piece of kindling. The lens remained clear for three years and then became cataractous. After ten years the eye became blind and painful and had to be removed.

#### **Corneal Tuberculosis.**

H. DARROW, Denver (by invitation), presented a man aged forty five years, who for the past eighteen months had been under the care of various physicians on account of a disturbance of vision of the right eye, associated with lacrimation and photophobia. At various times the tonsils and all the teeth had been removed, but without benefit. About one year before presentation, the left eye had become affected, and the patient became incapacitated for work. Examination on April 10, 1921, showed the right eyelids red and edematous, injection of the bulbar and ocular conjunctiva, and marked disturbance of the cornea. The latter was cloudy thruout, the most pronounced opacity consisting of a band about four mm. broad extending from the temporal side horizontally across the cornea and terminating in a yellowish white mass of exudate about two mm. in diameter. There were three or four other similar but smaller patches elsewhere in the cornea. These masses were approached by fine blood vessels. They were more or less superficial, and at several points there was the appearance of a loss of the superficial layers of the cornea, but these spots failed to stain with fluorescein. The vision was finger counting at ten feet. The general appearance of the left eye was similar to that of the right, except that the eye was more acutely inflamed, the patches of exudate in the cornea being larger and the blood vessels more numerous. The vision of this eye was

finger counting at six feet. There was no definite pain in either eye, but photophobia and lacrimation were marked. A Wassermann was negative, as was a general examination by an internist. Injection subcutaneously of one mg. of old tuberculin produced severe general, local, and focal reactions. The focal reaction was so intense, that for twenty four hours the eyelids could not be opened voluntarily. The patient had been put on tuberculin injections starting with 1/10,000 of a mg., and increasing to about 1/1,000 of a mg. On account of a focal reaction which followed this dosage, the treatment had been omitted for a while, and resumed with a dose of 1/2,000 mg.

*Discussion.* E. T. BOYD, Denver. I have generally had better results by starting with a dose of 1/40,000 or 1/50,000 mg.

F. R. SPENCER, Boulder. We have been using very small doses, but usually the internist has given the treatment for us. Some men who have had a good deal of experience seem to think that a focal reaction is not entirely undesirable, and that the eye may improve more rapidly after such a reaction. I feel that Dr. Darrow is quite justified in continuing tuberculin.

G. F. LIBBY, Denver. For further stimulation of the cornea, I suggest light in some form. I should not hesitate to expose to sunlight, laterally rather than directly thru the pupil.

A. C. MAGRUDER, Colorado Springs. We usually start with 1/20,000 mg. of old tuberculin. There have been three cases of rather severe conjunctivitis from the Finsen light in Colorado Springs, and I should be careful about using the Finsen light on the eye.

W. H. CRISP, Denver. In cases which I have handled, the pathologist has followed the practice of using minimal doses, increasing occasionally to the point of a slight reaction, and then staying at the same or a smaller dose for a while before increasing again. I believe that a slight reaction is often beneficial.

**Burn From Welding Compound.**

W. C. and W. M. BANE, Denver, again presented a man who had been before the society in February, 1921, on account of an injury to the left eye by a splash of hot welding compound, which burned the ocular and palpebral conjunctiva near the inner canthus. Two months after the injury the eye became irritable, and it was found that a band of scar tissue which drew the upper lid inward near the punctum was causing the cilia to rub on the eyeball. Since then the patient had been bothered very little by the eye. Now, after an interval of nine months, so little deformity had resulted that it seemed unnecessary to consider any plastic surgery for the case.

*Discussion.* J. M. SHIELDS, Denver, had recently had a similar case, in which three symblephara had formed.

E. R. NEEPER, Colorado Springs, suggested that it might be possible to give the patient better drainage thru the lower canaliculus, as he was moderately troubled with epiphora in the mornings.

DR. SHIELDS thought there was enough destruction of the lid margins to make the tears run out in spite of anything that might be done.

W. C. BANE. It is essential to be guarded in the prognosis of these cases, because it is impossible to say under six months how much contracture there is going to be.

**Ephithelioma of the Conjunctiva.**

F. L. BECK, for G. L. STRADER, Cheyenne, Wyoming, presented a man aged seventy five years, who had a growth on the right eyeball which had started about a year previously. There was some inflammation and a slight irritation, but the patient stated that the eye had never been painful. The left eye had been struck by a stone twelve or thirteen years back, and had had poor vision ever since. The vision of the right eye was hand movements, of the left eye 20/100. The right eye showed a broad elevation in the conjunctiva, apparently beginning at the outer corneal margin, extending about half way around the cornea, and

averaging about five mm. across from the limbus to the outer edge of the growth. The surface of the tumor was covered with a rich plexus of blood vessels. The corneal epithelium was involved thruout. There was photophobia. The accommodation of the left eye was paralyzed, and the left lens was partially cataractous. The condition was diagnosed as epithelioma of the conjunctiva of the right eye.

*Discussion.* F. R. SPENCER, Boulder. Enucleation will probably not check the further growth of this tumor, but it will be necessary to exenterate the orbit. Radium would be useful, but should be used only after exenteration. Clinically the case is one of epithelioma.

E. R. NEEPER, Colorado Springs. A year ago I presented a woman with regard to whom there was a doubt as to diagnosis of an abnormal growth in the eye. Later on the eye became very painful, and another surgeon enucleated it several months ago. A pathologist opened the eye and examined it superficially; and he stated that there was no malignancy. The patient went home, and later underwent exenteration by the surgeon who had done the enucleation. The latest information about her was that she was under treatment for some mysterious liver trouble, and in my opinion she is suffering from a metastasis. In Dr. Strader's case it is doubtful whether enucleation will be sufficient.

W. A. SEDWICK, Denver, referred to a personal case in which consent had been refused for removal of an eye on which there was a growth at the corneo-scleral limbus. Subsequently enucleation, not exenteration, was done, and radium was used; but the patient later died from metastasis.

H. M. THOMPSON, Pueblo, would apply the cautery after exenteration, and then use radium.

J. M. SHIELDS, Denver, suggested that deep x-ray treatment might be more efficient than radium, on account of the rather limited range of action of the latter.

A. C. MAGRUDER, Colorado Springs, would make a microscopic examination of a portion of the tumor before deciding as to operation.

DR. NEEPER thought that if death were inevitable, the patient's departure would be rendered much more agreeable if the eye were removed as soon as possible than if the eye were left in place, with the added probability of extension to the brain together with the repulsive appearance of an ocular tumor in its later stages.

#### High Convergent Strabismus With Low Anisometropia.

F. R. SPENCER and C. L. LARUE, Boulder, presented a young man of nineteen years, in whom alternating convergent strabismus of approximately twenty-five degrees had been corrected by advancement of the left external rectus according to Worth's method. After the operation the patient presented himself for refraction, stating that he used his right eye for near vision and his left eye for distant vision. The right eye accepted  $-0.25$  sphere combined with  $-0.25$  cylinder axis  $170^\circ$ , the left eye  $-0.50$  cylinder axis  $105^\circ$ .

#### Keratitis and Hypopion of Doubtful Origin.

D. G. MONAGHAN, Denver, presented a man aged forty six years who had been first seen in October, 1920, on account of a severe disturbance of the right cornea, stated to have followed injury to that eye by an insect. At that time the pain had been very severe, and the eyelids were red and swollen. There were photophobia and lacrimation. The cornea was hazy and looked as tho the epithelium had been rubbed off. Under homatropin and applications of silver nitrat to the inside of the lids, the condition cleared up in about one week. The patient returned in June, 1921, at which time the right eye had been under treatment one month for iritis. The conjunctiva of the upper lid had the appearance of trachoma. It was red and swollen,

and there was no secretion. The cornea looked smoky, and in one area was again rough as tho the epithelium had been rubbed off.

General examination was negative, except that the man seemed to be on the verge of a nervous breakdown. Nose, throat, sinusses, and Wassermann test were negative. Two infected teeth were found by X-ray and were removed, and three others were removed on account of being dead and loose. Nevertheless the condition of the cornea became steadily worse. An abscess would form in the corneal substance, would rupture, and the break would heal over. Hypopion had gradually developed. Two subconjunctival injections of 1:3,000 cyanid of mercury had been given. The anterior chamber had been opened twice on account of the hypopion. Anti-syphilitic and antirheumatic treatment and tonics had been employed, and locally moist and dry heat, atropin, dionin, and silver nitrat. New spots in the cornea repeatedly formed and broke down. For several months the vision had remained fairly good, but now there was very little vision.

*Discussion.* W. C. BANE, Denver, suggested the use of antidiphtheric serum.

D. H. COOVER, Denver, would do a peritomy as well as using the antidiphtheric serum. After recovery from the peritomy, he would dust in protonuclein.

E. T. BOYD, Denver, approved of the peritomy, but thought that the next operation would be enucleation or evisceration. The eye was going to be a very unsightly one, and must of necessity be sightless because of the extensive involvement of the cornea.

DR. MONAGHAN had used protonuclein on the patient once, and the next day the man returned and said that the doctor could take the eye out but he did not want any more protonuclein.

WM. H. CRISP,  
Secretary.

# MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

SEPTEMBER 13, 1921.

## Injuries to Eye.

DR. E. C. ELLETT reported four cases, the first being Mr. E. M. first seen in Oct., 1899, with a history of having been struck by a chip of steel from a hammer the day before. There was a small wound in the conjunctiva down and out, and the vitreous was full of blood. This was before the days of X-ray and the presence of a foreign body could only be surmised. The eye cleared rapidly and in two weeks the vision was 15/40, and the fundus was dimly seen. The patient was not seen again until Aug., 1921. The right eye had been blind about 9 years. The pupil was filled by an organized membrane, the iris was slightly discolored and had new vessels visible on the surface. The eye was acutely inflamed. The X-ray showed a foreign body in the vitreous, but an attempt to remove it by a magnet was unsuccessful. The eye has been comfortable since this attempt, and some blood which appeared in the anterior chamber is lessening in amount. The tension is slightly elevated. The patient is shown for an expression of opinion as to what is best to do. Because of the fact that inflammation had subsided promptly, the patient's age (73), and length of time (22 yrs.), he had not advised enucleation. He had seen foreign bodies work out after remaining a long time.

Mr. M. aged 50, was cutting a log with a circular saw on Aug. 24th when the saw hit the metal carrier holding the log, and a foreign body struck him at the inner end of the left eyebrow. Vision was 20/80. The eye was normal except that a tear could be seen in the choroid in the extreme nasal part of the field, and the tension was slightly reduced. The X-ray showed a large foreign body which was supposed to be partly in the ball. An incision was made over the internal rectus muscle and the foreign body removed with a

magnet without entering the eyeball. It was a piece of steel 10x4x3 m.m. Antitetanic serum was given and the eye recovered promptly.

Dr. Ellett showed a section of an eye which he had first seen in Dec., 1900, with a clean linear wound thru the ciliary region of the left eye caused by a piece of glass. The eye recovered with vision of 15/25 and a small vitreous opacity. Four years later there was a retinal detachment, retinitis proliferans, vision 20/200. June, 1921, vision was lost, tension 120, McLean, eye red and painful. Enucleated July 14th with implantation of glass ball. The other eye was normal.

Dr. Ellett showed the eye from a case of foreign body in the vitreous reported at the last meeting. The inflammatory symptoms increased with the formation of a yellowish margin in the interior chamber, and the eye was enucleated on Aug. 24th, six weeks after the removal of the foreign body. There is total detachment of the retina, and the vitreous is represented by a peculiar looking mass extending forward into the anterior chamber.

## Keratitis With Increased Tension.

DR. A. C. LEWIS reported the case of J. W. F. who came nine days before, complaining of pain in right eye with vision reduced to moving objects at 3 ft; O. S. V.=20/80.

Eight weeks before, he was struck in this eye by a twig which made it pain for a few minutes only. It seemed to be quiet after that. Five weeks later the vision became bad in this eye quite suddenly. Since then he has been troubled with a dull aching pain in it, worse at night.

The cornea is cloudy and the surface is rough and appears steamy. The deeper layers seem to be clear. Pupil round, regular, 3 mm. and responds slightly to light. Reacts moderately to mydriatics and miotics. Iris appears normal, anterior chamber normal. Slight circumcorneal and conjunctival injection. Tension O. D. 55 (McLean) before using eserine.

47 to-day after using it a few days. T. O. S.=40. Media apparently clear beyond the cornea. Fundus reflex seen by transillumination on all sides.

The etiology is undetermined. It seems improbable that so slight an injury could cause this condition after five weeks time. No focus of infection found in teeth, tonsils or nose. Urinalysis and blood Wassermann negative. General health good. Tuberculin test not made.

*Discussion.* DRs. SIMPSON and BLUE asked if atropin was used at the beginning, and if there were adhesions then. They think that it is a beginning secondary glaucoma.

DR. E. C. ELLETT said that corneal changes appeared to be in the superficial epithelium.

DR. STANDFORD thinks that there is also a punctate keratitis.

DR. LEWIS, closing, feels sure that changes are only in the superficial layers of the epithelium. He thinks that there is also a low grade uveitis, which accounts for the changes in the iris.

S. S. EVANS, SECRETARY.

### OMAHA AND COUNCIL BLUFFS OPHTHALMOLOGICAL AND OTO-LARYNGOLOGICAL SOCIETY.

NOVEMBER 16, 1921.

DR. JOHN B. PCTTS, PRESIDENT.

#### Atropin Conjunctivitis.

DR. H. GIFFORD, Omaha, discussed the likelihood of confusing such a case with trachoma, when the previous history is not known. In his experience, the substitutes for atropin, duboisin and scopolamin had produced the same reaction as atropin in susceptible individuals, so in cases like this when mydriasis is required to keep the pupil from becoming bound down, he continues the atropin in spite of the presence of atropin conjunctivitis. The patient also showed an acute iridocyclitis, the result of partial absorption of a traumatic cataract. After an injury two years before, he developed a

cataract which had remained quiet for some time after being needled. It then had a succession of attacks of acute inflammation, evidently due to absorption of the lens material. During some of these attacks, he showed hypopyon. When this was removed on one occasion, culture proved to be sterile, so it was evidently a purely chemical irritation. Dr. Gifford has seen several cases like this as an episode in what he has reported as spontaneous cure of senile cataract.

#### Concussion Injury.

DR. F. W. DEAN, Council Bluffs, showed the photograph of a patient who had been shot in the right temple with a loss of sight in both eyes, about one year previously. The bullet was seen to be pressing in the upper cul-de-sac and was removed. Dr. L. B. Bushman stated that he had seen this patient at the time of the injury, and that the right eye was entirely collapsed, due evidently to rupture from concussion at the back of the eye. The optic nerve of the left eye had evidently also been cut by the bullet. Dr. H. Gifford had also seen the patient and said that it presented a typical rupture of the globe by contrecoup, the anterior part of the eye not having been touched by the bullet.

*Discussion.* DR. S. D. MAIDEN told of a case seen in the army, in which one eye had been destroyed by a bullet and the other eye was said to be entirely blind. The patient was complaining of pains in the head. X-ray revealed a large fragment of the shell in the apex of the orbit, protruding into the sphenoid. When this was removed thru the nose, the pain ceased almost at once, and vision gradually began to return in the eye, until when last seen, he was able to read large print and recognize people easily.

The rest of the evening was devoted to reports from members who had attended the meeting of the Academy at Philadelphia; Drs. H. B. Lemere, S. R. Gifford, A. R. Knode, C. T. Uren, J. M. Patton, and C. Rubendall.

SANFORD R. GIFFORD.

RECORDING SECRETARY.

**CHICAGO OPHTHALMOLOGICAL SOCIETY.**

OCTOBER 24, 1921.

DR. EPHRAIM K. FINDLAY, PRESIDENT.

**Skin Grafts for Cicatricial Orbit.**

DR. HARRY WOODRUFF presented a patient upon whom he had performed skin graft for a cicatricial orbit. The patient suffered the loss of her eye from a lime burn in childhood. At the time of the operation, the patient still had the stump of an eye which was enucleated. Skin grafts were put in by the well known method of placing Thiersch grafts on plates of lead or tin and fastening them in an artificial culdesac.

**Physiologic Hyaloid Artery Remnants.**

DR. ROBERT VON DER HEYDT: When remnants of the hyaloid artery are seen by focal illumination with the ophthalmoscope they are considered persistent in the sense that nature has not fully completed the absorption in the normal manner. Very decided cases of this kind are often associated with various other congenital ocular malformations.

The hyaloid artery is carried forward to its expansion on the posterior capsular surface of the lens in the third month of fetal life. At birth, according to Parsons, the whole of the vitreous lental system of blood vessels has become absorbed and has disappeared. That this was not quite true has now been disclosed by the Gullstrand slit lamp in conjunction with the binocular microscope, in observing the living eye.

A very large percentage of normal eyes show a long spiral formed vessel remnant attached somewhat nasally and downward from the lens center on the posterior capsule. This physiologic remnant hangs downward in the now definitely discernible optically empty posterior lental space, first described by Berger. This space, as can be easily observed, is quite a large and deep one, not as mentioned by Salzmann, a capillary slit. On motion of the eyeball, the lower free end of the spiral remnant is seen to gyrate or

swing freely. At times the spiral elongates to quite a degree during this movement.

That we are dealing with the physiologically natural disposition of this remnant and not with an occasionally pathologic persistence of this vessel structure is now certain. First of all, there is found a uniformity in thickness. Secondly, the great number of instances where these structures are found in normal eyes absolutely excludes their presence as being a chance finding. At least 50 instances in youthful individuals, where the pupils were dilated incidental to refraction, have been observed within the last year in his office practice.

There can be no doubt that this delicate structure is destroyed in the process of fixation and hardening incidental to the preparation of specimens for histologic examination. Other structures that did not withstand this process of preparation have been observed in great numbers by examination of the living eye with the slit lamp under high magnification. Among these it is interesting to mention the various types of vacuole formation within the lens structure, subcapsular in location, and the physiologic and pathologic dew like changes in the cornea. We commonly find star shaped pigmented remnants of the pupillary membrane on the anterior capsule, and exceedingly often delicate cotton and spider web like remnants, attached to the iris and floating with free ends in the aqueous. These latter are found in about one-third of all eyes, tho not as frequently in old age.

Why do we find these remains of the hyaloid artery in some eyes and not in others? Why, when found, are they always bilateral?

There are several factors which predispose to their finding final lodgement in the postlental space. First, we must assume that in order to make their appearance within this space, a comparatively central or more posterior severance of this vessel must occur. This was proven for, when found, they were all quite long. It seemed quite likely

that during the growth of the eyeball the vessel remnant was drawn taut. At the time of the rupture, for this reason, it was projected toward the lens. This tension seemingly also accounted for the spiral and curled up form always assumed by the hyaloid artery remnant.

If the point of separation was anterior and there was space present within the posterior canal, the longer end might for the same reason normally gravitate toward the nerve head attachment, where he anticipated it might be found in many cases, were we to succeed in making better observations and penetration by focal light into this area. It must, however, be remembered that in this area the increased reflection from the retina and luminous nerve head might be sufficient to obscure this delicate structure. In the anterior situation behind the lens it was visible only when under direct focal illumination.

As a patency of the canal of Cloquet is necessary for a successful gravitation, the normally variable fluidity of the vitreous within certain limitations would not be a factor favoring its appearance or absence, except that possibly its swaying motion might aid dislodgment.

In order to expect to find the artery remnant posterior to the lens, it therefore was necessary that a somewhat posterior separation occurred, and the canal be open and free to admit of its gravitation. A certain position of the fetal head in utero probably favored the gravitation toward the postlental space, at the time of the splitting of this vessel remnant, a third and important factor, contributing toward the creation of this new and interesting histologic finding.

#### **Affections of the Eye Induced by Undue Exposure to Light Rays.**

PROFESSOR J. VAN DER HOEVE, of Leiden, Holland, said this topic was of sufficient importance to reemphasize some of the points he had previously brought before the profession. (*Amer. Jour. of Ophth.* v. 3, p. 178).

Formerly, lack of illumination in schools and in factories was spoken of,

and ophthalmologists went around with photometers to determine if in different places the scholars, the workers in factories and other industrial establishments had sufficient light. Today every school and every factory has the necessary amount of light, and we do not think so much about a lack of light as we fear that the artificial light sources are so strong as to effect the eyes. It is very well known that undue exposure to light, either natural or artificial, is a factor in causing many ocular disturbances.

In Europe, during eclipses of the sun in the last ten years, hundreds and perhaps thousands of people had damaged one or both eyes in staring at the sun with their eyes wholly unprotected or imperfectly protected.

Regarding the different parts of the spectrum which can cause disease, the infrared rays have been the least studied. Vogt attributes to them the causation of glass workers' cataract. The visible rays are generally considered to be the cause of eclipse blindness. The effect of the ultraviolet rays on the eye is that which has been the most studied, especially in the last fifteen years.

Not all the ultraviolet rays, which fall on the eye, are transmitted. The different media absorb a great part of them. Numerous experiments have been conducted to determine the absorptive capacity of the various structures of the eye for ultraviolet rays; and altho the results of the observations and investigations of different men are somewhat at variance, it is known with certainty that the cornea and lens in particular partially absorb the ultraviolet rays.

The experimental work of Parsons shows that the cornea absorbs all rays beyond 295 millimicrons completely, and has no absorptive capacity for rays of greater wave length; whereas the lens completely absorbs all rays beyond 350 millimicrons. The line is not a sharp one, absorption commencing at about 400 millimicrons. There are lenses which beyond 400 millimicrons absorb completely. Hallauer found youthful lenses which trans-

mitted rays of 310-330 millimicrons, and Schanz a juvenile lens, which transmitted rays from 300 millimicrons upwards.

From these results it is known that when ultraviolet rays fall on our eyes, the surface is reached by rays of every possible wave length, the iris and lens by rays from 295 millimicrons upwards, the retina as a rule only by rays from .350 millimicrons upwards, in some cases from 300 millimicrons, and in others 400 millimicrons and upwards.

As a typical instance of the effect of natural light rich in ultraviolet rays on the human eye there is the well known snow blindness. As sources of artificial light of this kind, which can damage the eye, the author speaks of arc lamps, mercury vapor lamps, electric welding, short circuit flashes, etc. Changes by lightning are generally attributed to other causes.

One of the first affections which the human eye suffers from natural and artificial sources of light rich in ultraviolet rays is photophthalmia, which is characterized by intense photophobia and lacrimation, with frequently blepharospasm and ciliary neuralgia. There is acute conjunctivitis, and in the severest cases the cornea and iris may be involved in the inflammation. The inflammation of the superficial parts of the eye is generally attributed to the shorter waved radiation, whereas the affection of the inner eye is caused by the longer waved ultraviolet rays and the light rays. This difference is probably the cause of the two different kinds of snow blindness that we distinguish, one with a preponderance of the external disease of the eye, the other with a preponderance of the internal disease of the eye, which may be found separate or together, according to the presence of rays of shorter or longer wave length, or of both.

Birch-Hirschfeld has found that the posterior layer of the iris can be seriously damaged, and that the ciliary processes show hyperemia, hemorrhages, swelling and desquamation of the epithelium, and inflammation with

fibrinous exudation in the anterior and posterior chambers. The inflammation of the eye was especially developed in the ciliary processes; the choroid showed hyperemia. In the retina this author found degeneration, especially when the eyes were aphakic. Nearly every part of the eye can be damaged by light rich in ultraviolet rays. It is known that in sunlight and in diffuse daylight many ultraviolet rays are present, especially those with a wave length between 300 and 400 millimicrons. In the last twenty-five years the range of rays emitted by artificial lights contains more ultraviolet rays than formerly. Consequently during the whole day, at least as long as our eyes are opened, they are irradiated by light rich in ultraviolet rays—sunlight, diffuse daylight, artificial light—therefore the fear is justified that this may damage our eyes.

Daland in 1917 pointed out that the Eskimos on the coasts of Alaska, Siberia and the islands of the Behring Sea, and Arctic Oceans suffered very much from snow blindness even on cloudy or dull days. Many Alaskan pioneers have suffered snow blindness by dispensing with goggles, under the conditions, believing that they were safe as long as the sun was hidden by clouds. The experience of the Eskimos is sufficient to prove that diffuse daylight may damage the eyes, so that light sources and goggles cannot be called ideal, which make the light equal to diffuse daylight. The Eskimos show conjunctivitis, cataract, trachoma, and snow blindness as common ocular diseases. The conjunctivitis and snow blindness may be caused by the ultraviolet rays. Relative to cataract, it is an open question whether it can be caused by ultraviolet rays.

In 1898 Hirschberg pointed out that in India senile cataract becomes mature about twenty years earlier than in Europe. Whereas in his clinic in Berlin cataract comes to operation at an average age of 62 years, he saw in the hospitals of Calcutta, Jaipore, Bombay, that Hindus were operated for senile cataract about the age of 46

years. Hirschberg attributes this early maturity of the cataract to the heat of the sun, but Professor Van der Hoeve says it may just as well be ascribed to the other rays of the sun. Snell seems to agree with Hirschberg in regard to the age of the cataract patients who come to operations in Europe. Hirschberg found in Germany an average of 62 years for senile cataract, and Snell found about the same age even in bottle makers. Brockman gave to Snell the following statistics about the age at which he operated cataract in India:

In Snell's statistics (England) the age of operation is in 78 per cent. between 51 and 70 years; in Brockman's (India) in 75 per cent. between 40 and 60. Whereas in Snell's statistics the decennium 61-70 contains 47 of the 78 per cent., in Brockman's statistics the decennium 51-60 only 40 of the 75 per cent. We can draw from the two sets of statistics only the conclusion that in India, where Brockman operated, senile cataract comes to operation more than ten years earlier than in Sheffield. Snell tries to explain this fact by the earlier maturity and short lives of the Indian natives, but the fact remains that in India cataract is earlier than in Europe.

According to certain observers, if ultraviolet rays cause cataract, people who live in high regions would have more cataract than other people, and this is not known to be the case. Light certainly in the mountains contains more ultraviolet rays than in lower regions because the diffusion of light is less in the higher regions. But this increase of ultraviolet rays is greater for the rays of shorter wave length, than for those of longer wave length, and it is known that they first cause irritation of the eye and photophthalmia, so that the eyes must be kept more closed or be protected by goggles; in both cases the number of rays which reach the lens will be diminished.

If light is a factor in the origin of cataract, it is only one of a great many factors, which act on the whole organism or on the eye alone. That light is

a principal factor in the origin of senile cataract is rendered highly probable by established facts.

How is it possible that light, rich in ultraviolet rays, damages the lens so that senile cataract occurs? The opacities obtained have nothing to do with senile cataract, which almost never begins in the pupillary part. Just like the epithelium of the conjunctiva and cornea, the capsular epithelium too may be damaged directly by relatively short exposure to extremely strong light, rich in ultraviolet rays.

The author put forward the hypothesis in 1912 of how it is possible for the ciliary body to be damaged when the eye is exposed to light, especially rich in ultraviolet rays, which could cause senile cataract. In snow blindness the ciliary region shows tenderness, when it is touched, and the patients suffer from severe ciliary neuralgia. The ciliary processes are damaged, but how is this possible? The ciliary processes are well protected from the influence of light, by cornea and iris, by conjunctiva, sclerotic, the muscular part of the ciliary body, and the pigment layer. The author pointed out that the lens is optically heterogeneous, not homogeneous.

By the expression optical heterogeneity is understood that there are present small particles which when light falls upon them, become light sources themselves and *disperse the light on all sides*. Optical heterogeneity is best known by the fact that a sunbeam falling thru a narrow slit into a dusty room can be seen from every side, because every particle on which the light falls, spreads the light on all sides.

Fluorescence is the quality of a substance that every part of the substance becomes, if light falls on it, a source of light itself which spreads the light on every side. In contrast to diffuse light the wave length of the fluorescent light is different from the wave length of the light which causes the fluorescence.

If the ultraviolet rays are less in number and the light which strikes our eye is not so intense, no inflammation will occur; but the continual everlasting

ing radiation of the few ultraviolet rays on the ciliary processes will be able in the lapse of years to cause changes in the epithelial cells, so that the secretion is changed a little. Even a very trifling alteration of the aqueous is sufficient to cause malnutrition of the lens which may, in the course of fifty years or more, lead to obscuration of the lens, to senile cataract. When the diffusion of the lens is so strong that cataract ensues, it is probable that the pupillary part of the iris; and perhaps even the posterior layer of the iris will suffer too from the radiation of rays of short wave length, altho they are much more resistant than the ciliary epithelium.

Is there any affection of the retina known which can be due to the ultraviolet rays, and can be compared to the senile cataract? The author thinks we have such an affection in the senile degeneration of the macula lutea, which appears as a rule after sixty years, and becomes more frequent the older people are. With reference to cataract, the author has never found a degeneration of the macula directly after the extraction of senile cataract; and in the records of about 500 cataracts operated on in the last twenty or more years he has not found one case.

It was pointed out some time ago, that when the possible effect of ultraviolet rays was very much overrated, it was proposed to make windows of protecting yellow green glass, to cover every artificial light with them and to wear goggles. The author does not think now that anybody will be so afraid of those rays as to condemn people continually to wear protecting goggles, and he thinks also that it is not at all essential to protect our eyes continually. People in a normal condition might wear one of the protecting kinds of goggles, only when they are more than usually exposed to ultraviolet rays, i.e., on sunny days at the shore, or on the river, or on strongly reflecting roads and places on ice and snowfields, in hunting, in the fields, etc. Those people who have to labor continually in the vicinity of lamps which irradiate many ultraviolet

rays will do well to cover the light with one of the protecting glasses. While light rich in ultraviolet rays is a prominent factor in the origin of cataract and degeneration of the retina, it is only one of the numerous factors which may have an influence on the origin of these diseases.

*Discussion.* DR. E. V. L. BROWN stated that in those eyes which developed cataract, there was not only a change in the ciliary epithelium but also some change in the pigment area itself, and perhaps these rays came from behind rather than from in front, as Professor Van der Hoeve had explained.

DR. WILLIAM A. FISHER asked: Supposing that in a few sections of India the excess of heat is the cause of cataract, why are there not more cataracts in proportion to the inhabitants in the southern part of India than in the northern part? From the northern part of India a larger number of cataracts were reported than from the southern part; therefore, cataract must be more frequent among the population in the northern part than in the southern part. Why should the proportion not be equally as high or higher in the southern part where it is hotter? In India children 13 and 14 years of age were mothers. They developed earlier, and naturally they must have cataract earlier. Strange as it would seem, there were very few patients in India operated on for cataract who really knew how old they were.

PROFESSOR VAN DER HOEVE, in closing the discussion, and in replying to Dr. Brown, stated that it was possible the changes in the pigmentation of the iris came from the anterior also, and that there were more ultraviolet rays from the anterior part than the posterior part. The posterior layer was always diseased in cataractous eyes. The posterior rays would seem to have a peculiar influence on the structures within the eye.

He agreed with Dr. Fisher that it was difficult to determine the ages of Indian people. Major Smith and Elliot maintained that cataract occurs earlier in the Indian people than in

others. Cataract was seen in people of 30 to 40 years of age.

As to cataract being more frequent in the northern part of India, he did not believe the heat of the sun had much to do with it. In the Eskimos, who were exposed to the strong rays of the sun, cataracts were very frequent, and they received more ultra-violet rays in the polar regions and in the equator than we did.

## ROYAL SOCIETY OF MEDICINE.

### Section on Ophthalmology.

October 14, 1921.

Dr. James Taylor, President, occupying the chair.

### Models Illustrating the Development of the Human Eye.

MISS IDA C. MANN showed a series of well executed models to illustrate the development of the eye. For teaching purposes she regards them as superior to ordinary book illustrations.

### Probable Implantation Cyst.

MR. L. FLEMING exhibited a girl who, 18 months ago, received an injury to the eye. When she was seen six months after the receipt of the injury, there was a perforation at the limbus, the iris was adherent, and there was active iritis present. Six months later, a small nodule appeared at the nine o'clock position, but since that date there had been no appreciable increase in size.

*Discussion.* Mr. Treacher Collins did not feel certain as to its nature, but suggested that the diagnosis might be helped by employing contact illumination.

### Gray Mass in Vitreous.

MR. BOOKLESS showed a child with a gray mass in the vitreous, with arborization of vessels visible at the back of the lens. A week after being seen, a small nodule appeared on the back of the iris. This had progressively increased, and vision was reduced from 6/36 to perception of fingers at a distance of a few inches. The diagnosis seemed to rest between a congenital abnormality and malignant disease.

*Discussion.* Sir William Lister considered that it was a cyst of the

iris, with a membrane which had formed after the occurrence of hemorrhage in the vitreous. He did not regard the condition as malignant.

Mr. M. S. Mayou referred to a case he showed at a previous meeting, in which there was a similar appearance, but without a membrane. He agreed that the present case was one of cyst of the iris.

Mr. Treacher Collins considered that the primary factor was the cyclitis, which had produced a cyclitic membrane. This membrane probably caused an arrest of lymph circulation, which had resulted in the separation of the two layers of pigment at the back of the iris, a cyst having been caused by that. He advised puncture of the body, which, he thought, would probably bring about its collapse.

### Case of Benedict's Syndrome.

DR. WYLIE sent and MR. LESLIE PATON demonstrated, a case of Benedict's syndrome. The lesion was supposed to be in the red nucleus, catching the fibers of the third nerve.

### The Fourth Cranial Nerve.

MR. J. HERBERT PARSONS, F. R. S., gave a contribution on what he termed the riddle of the fourth nerve, the only nerve which had, in a complete sense, a dorsal decussation. It was probable, he said, that there were no decussating fibers within the central nervous system other than those passing out in the trunk of the nerve. A peculiarity of the fourth nerve was, that it was purely somatic in mammals; it supplied purely somatic muscles, and had no visceral fibers. There was an absence of experimental lesions in this neighborhood sufficiently exactly localized to produce definite results. Explanation, therefore, must be sought in comparative anatomy and embryology. The 4th nerve existed all along down to the lowest vertebrates; as shown in a slide it was found even in the lamprey, in which animal the eyes were very degenerate organs. The 4th decussated dorsally, going thru the anterior medullary velum in that animal, exactly as in the higher vertebrates. He exhibited slides illustrating the work of Davidson Black, showing the position of the

nuclei of the cranial nerves and their points of exit from the central nervous system. The same kind of thing was seen in various specimens of amphibiae. Cappel believed that migration of motor nuclei was especially associated with chemotaxis, due to the attraction to foci of incoming afferent impulses; and the last edition of Sir Arthur Keith's "Embryology" explained the 4th nerve as due to neurobiotaxis, but as to this view Mr. Parsons expressed his scepticism. Still, there was no doubt of the fact that in the evolutionary process the afferent side became evolved very much in advance of the motor response. Mr. Parsons pointed out the near association of the fibers of the 4th nerve with those of the 5th nerve at a very early stage of their development, both as to the relation of their branches and in regard to the ciliary ganglion. Investigation of the chief ganglion of the 4th nerve showed that it did not migrate from the motor part, but developed from the cells which were on the neural crest. There could be no doubt that this ganglion on the 4th was a posterior root ganglion, and that, certainly at this stage, the 4th nerve had motor somatic fibers in addition to sensory somatic fibers. He showed that complex synergic movements existed, brought about by nerve nuclei, with fibers which were presumably decussated, and which were correlated with each other in a remarkable way in the absence of cerebral hemispheres. Therefore, it must be concluded that even at a low stage there was an arrangement for coordinating the synergic movements of the eye muscles. Coordination was usually regarded as entirely cortical, and sufficient stress had not been laid on lower coordination centres. This idea did not detract from Hughlings Jackson's view; it merely divided Jackson's "top story" into a series of flats.

Dr. Gordon Holmes discussed the contribution.

#### Milestones in Refraction Work.

MR. ERNEST CLARKE read a paper on this subject, based upon forty years of ophthalmic work. He said that at the date he commenced to practise, it was

rare to correct any astigmatism under .50 D., or 1/80th of an inch. He passed his first milestone when, in his first year, he attended Donders' clinic at Utrecht, where more attention was being paid to refraction. In the Netherlands the diopter was thoroly installed, whereas in London oculists were still prescribing in inches. An enormous debt was due to Donders for clearing up the subject of refraction and raising that department to a scientific level. His work, published in 1864, is still a classic, and tho some of the statements had since been amplified, none had been negatived. At that date, too, retinoscopy or skiascopy had not become universal. The realization of the all embracing and deleterious effects of eyestrain had taken many years, it was now known that there was scarcely any nerve trouble which might not be due, in whole or in part, to eyestrain. In this matter it was the small errors which counted. Still, symptoms commonly attributable to eyestrain might owe their origin to nasal or dental trouble. The skilled ophthalmologist would look for extraocular as well as ocular causes. If a young person had an error of refraction, the correcting glasses should be worn always in the house, tho not necessarily at games out of doors. If this were done, the tendency was for small errors to disappear. Admittedly the wearing of glasses by the public school boy was a great disability.

Donders proved that presbyopia was not the opposite of myopia. Mr. Clarke had collected the records of 750 cases of myopia observed by him in the last 14 years. No case of high myopia with fundus changes was included, and all the cases given were treated by full correction, only allowing weaker glasses for near work in patients who were approaching the presbyopic period. The results were as follows: 101 showed a decrease in the myopia with the advance of age, and of these, 83 were over 30 years of age; 379 remained stationary, and of those, 306 were over 20 years of age. In 141 there was an increase in the myopia up to, but not exceeding, 0.50 D.; 129 increased in myopia 0.75 or more, and of

these 78 were under 15 years of age. Only 16 of the 750 increased over 2 D., and the maximum of 4 D. was reached by 5 patients. The common sense treatment was to try to make the patient normal by giving full correction of the myopia, and insisting that the glasses should be worn for every purpose within doors; in this way the ciliary muscle was trained to do its proper work without undue convergence. Donders' best work was, probably, in association with presbyopia, yet it took years for his teaching to bear fruit. Every presbyope must be carefully examined, his static refraction ascertained, also his accommodation power and with that knowledge one could safely give him an addition for near work. The correct treatment of presbyopia was one of the most important duties of the oculist, because these patients had arrived at a critical period of life, when they had many worries, and often were subjects of intestinal toxemia, making it necessary to stop every channel of nervous waste. If it were found, by static refraction, that eyestrain was present, distance and near glasses should be prescribed.

Mr. Clarke had seen a great change in the attitude towards cycloplegics. In early days atropin was the drug used, and at that date it was used excessively, but only for the young. To arrive at the truth it was necessary to test with and without a cycloplegic. He had done that in reference to a large number of patients; i. e., he put the patient thru a complete objective and subjective examination and selected the glasses, then he had put him under atropin, or homatropin, and put him again thru examination. In some of the cases the cycloplegia revealed nothing new, tho in a large number it showed an important difference, a difference which would decide between success and failure in treatment. The oculist's note book should record patient's static refraction, and in the majority of cases that could only be got, in a patient under 40 years of age, by using a cycloplegic. Once he had a record of a patient's static refraction, he did not again put

that patient under atropin. In the whole 40 years he had never had a case of glaucoma produced by a cycloplegic.

With regard to heterophoria, he spoke highly of Maddox's useful glass rod test. He agreed with Maddox's opinion that small heterophorias tend to disappear when the error of refraction is properly corrected and the glasses worn. He referred also to the great improvement in the treatment of squint in recent years. He had praise for Meyrowitz's latest model of ophthalmometer; it was, he said, a very accurate instrument, and a time economiser. He touched also on the types of trial frames, and concluded with a comment on the three cardinal maxims which were given him by his old master Luther Holden: (1) Think of your patient first; (2), think of your profession second; (3), think of yourself last.

*Discussion.* Dr. McCrea, speaking as a physician, emphasized Mr. Clarke's remarks as to the need for correcting slight errors of refraction; he had found them a prolific cause of the commonest symptom encountered by physicians, headache. With regard to cycloplegics, he, the speaker, did not care to read a report on a patient under 45 on whom a cycloplegic had not been used. He thought physicians should get more frequently into touch with such specialists as ophthalmologists.

Mr. Harrison Butler said he now seldom used mydriatics, and he believed he was getting considerably better results; his change of view he owed to his lamented friend Devereux Marshall. He suggested that some of the younger men might investigate how far the statement that the eyes were always changing with advancing years was true. He had discovered that certain patients got an alteration of the angle of astigmatism from time to time. With a certain type of cornea slight alterations might occur which varied the intraocular tension.

Mr. Ernest Clarke, in his reply, said he was certain the refraction was constantly altering.

H. DICKINSON.

# SPECIAL REPORT

## BUTYN, A NEW SYNTHETIC LOCAL ANESTHETIC: REPORT CONCERNING CLINICAL USE.

ALBERT E. BULSON, JR., M.D.

FORT WAYNE, IND.

Special reports of the committee on local anesthesia of the section on ophthalmology of the American Medical Association.

*Council on Pharmacy and Chemistry of the American Medical Association—Gentlemen:*

At your request the committee secured some samples of butyn, a new local anesthetic, which the manufacturers, the Abbott Laboratories, provided, and submitted it to animal experimentation and clinical trial. These experiments were begun several months ago by the individual members of the committee, and up to the present time seem to have been sufficiently extensive and conclusive to justify the report herewith submitted.

Tho the committee was supplied with samples of powdered butyn, it was thought best to follow the suggestions of the manufacturers and experiment with a 2 per cent. solution, and later, under appropriate precautions, use solutions of great concentration. Accordingly, this report, except where otherwise noted, applies to results as obtained with the 2 per cent. solution.

In accordance with your suggestion, we recorded our observations as follows, anesthesia, including onset, depth, penetration and duration; side actions, including immediate and late irritation, changes in pupil diameter, vascularity, intraocular pressure, desiccation of cornea and other side actions; toxic systemic effects, and comparative value in ophthalmic work, including major as well as minor operations. Under these various headings our observations are as follows:

### ANESTHESIA

Repeated trials indicate a striking rapidity of anesthetic action, as indicated by the fact that one minute after one instillation of a 2 per cent. solution

of butyn in the eye, surface anesthesia is sufficient to permit of touching the cornea or removing superficially placed foreign bodies without discomfort. This surface anesthesia lasts from fifteen to twenty minutes, when, in the average case, it begins to subside. Occasionally the anesthesia has been noted for from twenty-five to thirty minutes. The depth of anesthesia produced by one instillation is not sufficient for operations, or for even the removal of deeply embedded foreign bodies in the cornea. It is, however, sufficient for the painless extraction of superficially placed foreign bodies, the application of irritating astringents, and the determination of intraocular pressure with the tonometer. When the number of instillations is increased, there is a marked increase in the depth, degree and duration of the anesthesia.

For operative work the committee has followed the plan generally used when cocain is the anesthetic employed, which consists in four instillations, three minutes apart, the operative work to be begun from five to ten minutes after the last instillation. This method resulted in the production of an anesthesia deep enough and complete enough for all of the commoner major operations on the eye, with the exception of enucleation, which up to the present time has not been performed under butyn anesthesia by any member of the committee. The height of anesthesia appears to be secured at about five to eight minutes after the fourth instillation of the anesthetic, and its duration is from twenty to thirty minutes in the average case, tho

frequently lasting much longer, and in a few instances even the surgical anesthesia has lasted for nearly an hour.

#### SIDE ACTIONS

One instillation of a 2 per cent. solution of butyn almost invariably produces a mild hyperemia of the conjunctiva. This hyperemia is not noticeably increased by subsequent instillations of the anesthetic. It is controlled readily by epinephrin solution, or may be averted by combining epinephrin with the butyn. When epinephrin is not employed, the hyperemia gradually disappears in from thirty to sixty minutes. The hyperemia seems to be more marked and of longer duration in diseased eyes, even tho the active stage of disease has passed.

Butyn solutions do not affect the pupil diameter in any way, and produce no change in the intraocular pressure. There also is no desiccation or disturbance in the nutrition of the cornea, so far as has been determined. We also are of the opinion that butyn solutions do not deteriorate rapidly, even when exposed to air and light, nor is their anesthetic efficiency impaired by boiling.

#### TOXIC SYSTEMIC EFFECTS

In beginning the use of butyn, we were confronted with the statement of the Research Committee of your Council to the effect that butyn is two and one-half times more toxic than cocain when injected hypodermically into albino rats, and that the lethal dose of butyn when injected intravenously into cats is about equal to that of cocain. One member of our committee, Dr. H. M. Langdon, in conjunction with Dr. Herbert Fox, director of Pepper Clinical Laboratory of the University of Pennsylvania, has conducted some animal experiments with a view to determining the toxicity of butyn, and the result of those experiments confirmed those of the Research Committee of your Council. The manufacturers state that their animal experiments substantiate these findings.

However, in no instance, including the hundreds of times that butyn has been used by the members of the committee for minor as well as major operations on the eye, as well as in operative work in the nose and throat, have the slightest systemic toxic manifestations been noted. Following the report that surgeons and dentists had freely used butyn for surface and infiltrative anesthesia with no toxic results, some of the members of the committee have used butyn in paste and in concentrated solutions as a topical application for operative work in the nose as well as in the eye, with no evidence of toxic effects. The committee, in comparing the effects on animals and men, is inclined to believe, as suggested by Professor Sollmann of your Research Committee, that there may be (1) differences in absorbability from mucous membranes; (2) different ratio of toxicity in man and animals, and (3) different frequency of idiosyncrasies. It is probable that if butyn is used as extensively as cocain, there will be cases of toxic effects reported, and then it is a question to decide whether the symptoms are due partly to psychic causes, to idiosyncrasy, or to error in using more of the drug than required to produce the desired effect.

#### COMPARATIVE VALUE IN OPHTHALMIC WORK

In the use of butyn as a local anesthetic, cocain is used as a comparison, and our committee is unanimous in the opinion that butyn for purely surface anesthesia for minor operations is superior to cocain, for the reason that it acts more quickly, fewer applications are required, there are no objectionable side actions, such as dilatation of the pupil or desiccation of the cornea, and the anesthesia is more profound. For producing surface anesthesia for the removal of foreign bodies from the eye, the application of irritating astringents, estimating the intraocular pressure with the tonometer, or for any of the minor opera-

tive procedures, butyn solutions seem to be very useful.

For major operations, particularly those requiring opening of the eyeball, such as iridectomy and cataract extraction, the technic usually employed in obtaining a cocain anesthesia is employed in obtaining butyn anesthesia. The use of a 2 per cent. solution of butyn results in a more profound anesthesia than is obtained with a 4 per cent. solution of cocain, and without any objectionable side actions. For operations on the extrinsic muscles of the eyeball, the results are equal to those obtained with cocain, tho the committee believes that a solution stronger than 2 per cent, may be preferable.

#### INFILTRATION ANESTHESIA

In view of our understanding that butyn might prove quite toxic, we did not at first use butyn for the production of infiltration anesthesia, and only recently have we undertaken some experimental work, using both 0.5 and 1 per cent, solutions for the purpose. While our experience is limited, up to the present time we have had very satisfactory results. A 0.5 per cent. solution of butyn has been injected rather freely into the tissues for the purpose of doing advancements of the extrinsic muscles of the eyeball, for the opening of abscesses in the orbit and the appendages, and as an adjunct in operations in which the eyeball is opened. In the few cases in which this has been tried, a deep and satisfactory anesthesia has been secured. A more comprehensive report covering infiltration anesthesia with butyn will be made later, and will form a part of the committee report to be presented before the Section on Ophthalmology of the American Medical Association.

#### BUTYN IN NOSE AND THROAT WORK

The chairman of the committee has used butyn solutions as a routine for several months in nose and throat work, and the results, in brief, are considered worthy of being a part of this

report, as they bear directly on the question under consideration.

The recognition of the fact that the nasal mucous membrane possesses greater area and increased absorbing surface, as compared to the conjunctiva, made it advisable to begin with weak solutions and use smaller amounts until the toxicity in the average human being could be determined. Therefore, at first one application of butyn in 1 per cent. solution was made over small areas within the nose, and tests for anesthesia were made subsequently at intervals of from one to three minutes. These tests indicated a mild surface anesthesia produced within one minute. Later these tests were extended to include surface anesthesia sufficient for everything pertaining to an examination, including the use of applicators and eustachian catheters, as also for the allaying of discomfort occasioned by the use of astringents or escharotics. Finally, butyn in 5 per cent. solution was employed as a routine in producing anesthesia for all of the major intranasal operations.

As butyn produces no ischemic effects, there is no shrinking of tissues following its use; hence the condition of the intranasal tissues remains approximately the same except for the anesthesia. This is a valuable feature in those cases in which a portion or all of a turbinate is to be removed. When combined with epinephrin, butyn in 5 per cent. solution produces an anesthesia sufficient for all of the major intranasal operations, including submucous resection of the septum, turbinotomies and intranasal operations on the accessory sinuses. Not only is the anesthesia very satisfactory, but up to the present time not the slightest toxic effects have been noted in the hundreds of operative cases in which the anesthetic has been used. Among these cases are thirty-eight consecutive submucous resections of the septum, and twenty-six consecutive intranasal operations on the nasal accessory sinuses.

The technic employed in obtaining anesthesia has been similar to that employed in obtaining anesthesia from

cocain, except that the butyn has not been used in greater concentration than 5 per cent. solutions. The anesthesia lasts from thirty to forty minutes.

#### EXCEPTIONS

In comparing butyn anesthesia with cocain anesthesia, the committee has discovered that occasionally a patient seems to be immune to complete local anesthesia from butyn employed in either 2 or 5 per cent. solutions. These cases are relatively few. The failure to secure complete local anesthesia in this very limited number of cases may be due to psychic disturbances or a highly neurotic temperament, or perhaps to a peculiar idiosyncrasy which makes the patient, in a measure, intolerant to the anesthetic effect of the drug.

#### SUMMARY OF CLINICAL RESULTS

The committee now has a detailed record of clinical experiences with butyn in the performance of several hundred major operations on the eye and the nose and throat. These include cataract extraction, iridectomy (including that done for the relief of glaucoma), trephine operation, magnet extraction of foreign bodies, tenotomy and advancement of the ocular muscles, pterygium operations, removal of cysts and other tumors from the eyeball or lids, grattage, and a few cases of plastic surgery of the lids, including the correction of entropion and ectropion. As yet no enucleations have been performed under butyn anesthesia, but we believe that such an operation may be performed very satisfactorily.

Local anesthesia is put to the best test when used for operations which involve cutting the iris or extrinsic muscles of the eyeball. The committee, December 1, had a record of thirty-nine cataract extractions combined with iridectomy, twenty-three iridectomies for glaucoma or as preliminary to cataract extraction, twenty-one capsulotomies and iridotomies, and eight muscle advancements, all

satisfactorily done under butyn anesthesia. Aside from this there were a large number of other eye operations requiring less profound anesthesia, which were performed satisfactorily under butyn.

In nose and throat surgery, butyn anesthesia has been used in practically all of the major intranasal operations, including submucous resection of the septum, turbinotomies, opening of accessory sinuses (including exenteration of the ethmoid cells), tonsillectomy and adenectomy, in all numbering nearly 200 cases.

In practically all of these cases, including nose and throat as well as the eye, the anesthesia has been very satisfactory, and the few exceptions are considered exceptions such as might occur under any local anesthetic. Two per cent. solutions of butyn were used for nearly all of the eye operations, whereas 5 per cent. solutions were used in most of the nose and throat operations. If more extended experience confirms our present belief that there is little cause for apprehension concerning toxic effects from the judicious use of butyn, then a 5 per cent. solution may be the strength of concentration preferred in some of the major operations in which profound local anesthesia is desirable and has heretofore been sometimes difficult to secure.

A detailed report of each and every one of our cases would extend this report to an unnecessary length, but will be submitted if deemed either advisable or necessary.

#### CONCLUSIONS

The results of the clinical and experimental use of butyn seem to justify the committee in arriving at the following conclusions:

1. It is more powerful than cocain, a similar quantity being required.
2. It acts more rapidly than cocain.
3. Its action is more prolonged than that of cocain.
4. According to our experience to

date, butyn in the quantity required is less toxic than cocain.

5. It produces no drying effect on tissues.

6. It produces on change in the size of the pupil.

7. It has no ischemic effect and therefore causes no shrinking of tissues.

8. It can be boiled without impairing its anesthetic efficiency.

Respectfully submitted.

ALBERT E. BULSON, Jr., Fort Wayne,  
Chairman.

WILLIAM ZENTMAYER, Philadelphia.

EDGAR S. THOMSON, New York City.

H. MAXWELL LANGDON, Philadelphia.

HARRY S. GRADLE, Chicago.

### ANNOUNCEMENT

#### **PATHOLOGIC EXHIBIT FOR THE INTERNATIONAL CONGRESS OF OPHTHALMOLOGY.**

The Army Medical Museum, in connection with the Section on Pathology of the American Academy of Ophthalmology and Oto-Laryngology is preparing an exhibit of pathologic material for the coming International Congress of Ophthalmology. Owing to the short time that the Section on Pathology has been in existence, the material it already has on hand is of a necessity somewhat limited. In order

to have a creditable exhibit, all American Ophthalmologists are earnestly urged to send any interesting pathologic specimens they have to the Museum; either as an outright gift, or as a temporary loan during the Congress. Such specimens should be plainly labeled, described fully, and sent to Major G. R. Callender, Army Medical Museum, Washington D. C., Section on Ophthalmic Pathology.

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JEAN MATTESON, Room 1209, 7 West Madison Street, Chicago, Ill.

## THE RISKS OF OPERATION.

The case reported in the first paper of the December number brings out in striking and tragic fashion the chances for misfortune that attend every operative invasion of living tissues. But it does more than this, it illustrates how, in spite of the most intelligent and conscientious care in the application of known precautions, disaster may follow even comparatively slight operative interference; and that the careful study of such a case even after it has run its course, and with all the aids that laboratory methods can give, may still leave us ignorant of just how the untoward result was brought about.

Apparently, organisms, not pathogenic to other patients and animals, or a state of susceptibility quite unrecognizable by any known method of diagnosis and not at all to be expected, were able to destroy all the hopes of patient and surgeon. Unforeseen disaster is a possible outcome of any operation. Absolute freedom from risk cannot be claimed for any technic or

by reason of any experience. The possibility should be stated to patient or friends, and placed in contrast with the certain or probable results of not resorting to operation.

But the fact that such risks cannot be wholly escaped is no excuse for failure to take every known precaution to avoid danger. Neither should the rarity of such occurrences excuse neglect of measures that will render them as rare as possible. If in spite of all precautions, such an accident will occur once in a surgical life time; and with little care would only happen twice in the same period; the greatest attention to detail would still be justified by reduction in danger. No one worthy of the name of surgeon will feel that any trouble is too great, to give the patient the best results. The surgeon is paid not to guarantee success, but to do all that can be done to secure it.

It is this duty to guard in every possible way against disaster that demands we shall not operate on both eyes at the same time. The case al-

luded to illustrates this. If both eyes had been operated on at once for unimportant pterygia, and both lost by the virulent infection, the tragedy would have been infinitely worse. The reason for doing bilateral operations is nearly always convenience. The reason for not doing them is to avoid the remote possibility of leaving the patient blind thru our interference. Such operations have often been done without harm, but no surgeon has the right to take even the smallest chance of blinding a patient; and this will happen if operating on both eyes at one time is tried often enough. A thousand operations without harm do not compensate one patient for blindness.

Operations that do not destroy the sight, but still leave the patient worse off for the interference, are not quite so bad as those involving destruction of an eye; but they are extremely discreditable to our profession. They have rather frequently been done on the eye muscles or their tendons. In these cases, bad results do not usually depend on undiscoverable factors or complications that could not be foreseen. They depend more on ignorance of the complicated problems involved in any operative interference with the functions of these muscles; and on recklessness that is willing to take chances of being right, without the trouble of thoroly studying out all the conditions present. A generation ago there were patients going about whose convergent squint had been converted into wide divergence of the visual axes, by tenotomy, often repeated without even a trial of glasses. There are now patients without such noticeable cosmetic defects, whose headache and neurasthenia have been made more burdensome and permanent by elaborate and carefully performed advancements, that seemed to reduce greatly the heterophoria, but produced unfamiliar coordinations with which the weak nervous system was unable to deal.

When the operation has been wisely decided on, well chosen and skillfully performed, the patient has enough risk to run in the uncertainty of the per-

fection of its result and the possibility of disaster. The latter should be reduced to the extreme minimum; by careful consideration of all suggested preventives of infection, by the working out of an individual technic of which the surgeon is completely master, and by its conscientious application in every case, no matter how remote the apparent risk from omission of any detail. Only then can patient and surgeon face calamity with the feeling that all has been done that was humanly possible to prevent or minimize it. E. J.

### THE OFFICIAL LANGUAGES OF AN INTERNATIONAL CONGRESS.

Differences of language have always been a handicap to international scientific congresses. Few ophthalmologists can understand and easily follow more than one or two languages other than their own; and no one wishes to listen to papers and discussions that he does not understand. The most successful gatherings will always be those in which but one language is spoken, the one with which every one present is most familiar. The same is true to a less extent of the reading of the transactions of such a congress. One feels less interest in a volume in which many of the papers are printed in languages read with difficulty, or quite unknown.

On account of this difficulty, it has been customary in the past to select as official languages a few (usually three) most familiar to the mass of members likely to attend such a gathering, and to require that all papers and remarks in discussion before the Congress should be presented in one of the official languages, and so printed in its transactions. This custom has been followed for the Washington International Congress, English, Spanish and French, obviously the languages of the greater part of those who could be expected to attend and take part in the proceedings, being selected.

A larger number of languages would have greatly increased the difficulties of preparing the pre-session volume and

the abstracts of papers, to be printed in the program in *all* the official languages. On this account it was deemed wise not to include Italian among the official languages, altho it has been so included in two or more preceding international congresses of ophthalmology. Other nations speaking other languages will be represented in the Congress, but from none of them has protest or criticism been offered on that account, except with regard to the German language. According to the editor of the *KLINISCHE MONATSBLAETTER FUER AUGENHEILKUNDE*, the opening address at the Congress held at Vienna protested because "*die deutsche Sprache*" was shut out from the Washington Congress. A similar protest came from the ophthalmologic society of Finland, reaching the committee to whom it was addressed after it had been published in the German journal.

There seems very little excuse for honest misapprehension in this matter. In the original announcement regarding the scientific proceedings of the Washington Congress it was clearly stated: "Each speaker in discussion may use such language as he prefers, but the substance of his remarks must be furnished for publication in one of the official languages of the Congress." In reply to every question about this, it has been explained that this applied to the presentation of any paper that might be submitted under the published rules, and accepted for the Congress.

The complaint of Germans and their partisans amounts to this, that German was not made an "official language" of a congress where Germans were not expected to attend, and where under any circumstances very few of them would have attended. To treat the German language as every other language, except those adopted, had been treated, has called forth the cry of "Boycottiren" both at the Vienna and at the Heidelberg Congress, in which gatherings no language but German seems to be used.

Whether Germans should have been invited, when no diplomatic channels

existed to carry the invitation; or whether some later or less dignified form of invitation would not have awakened equal resentment; or whether special inducements might not have been offered that would have brought some Germans to the Congress, are questions about which argument is possible; but the complaint of "Boycotting" "*die deutsche Sprache*" is poorly founded. E. J.

### CHANGES.

The new volume will probably contain more pages than its predecessors. To provide for this and the future growth without unduly increasing the bulk of the JOURNAL, a thinner paper of equally good quality has been chosen, and is used in the present issue.

Hereafter the lists of CURRENT LITERATURE will be published monthly in the JOURNAL instead of quarterly in OPTHALMIC LITERATURE. It seemed well to suspend such monthly publication while the literature was still so mixed by the failure of international communications. But this difficulty has largely been overcome, and it is believed monthly publications will prove more serviceable. Except for this OPTHALMIC LITERATURE will be published as last year.

### BOOK NOTICES.

**Atlas of Slit Lamp Microscopy of the Living Eye.** Prof. Dr. Alfred Vogt, Director of the Ophthalmic Hospital at the University of Basle. Authorized translation by Dr. Robert Von Der Heydt, Chicago. Large octavo, 153 pages, and 38 plates containing 370 figures. Berlin, Julius Springer, 1921.

The phrase "microscopy of the living eye" may properly be applied to all examinations of the anterior segment of the eye with a magnifier, and to all examinations with the ophthalmoscope. It has become current in connection with the use of the so-called corneal microscopes. The "slit lamp" is Gullstrand's modification of the Nernst lamp, a powerful and eco-

nomie illuminant, not widely used because it is somewhat costly, and a little time is required to develop the light after the current has been turned on.

The recent advances in the study of the ocular media have been due more to the improved form of illumination, than to increased magnifying power in the microscope lenses. But it is probable that a more convenient and equally efficient source of light will be found to replace the slit lamp. Indeed, in this work "in many instances the substitution of a microarc lamp is suggested." But an essential character of the illuminant is the sharp limitation of the illuminating pencil of light, whatever its source, so that it gives an "optical section" of the tissue.

Four ways of using the light are given. 1. Direct lateral illumination, ordinary "focal illumination." 2. transillumination, the light shining thru the tissue to be examined. 3. Examination of reflecting surfaces in circumscribed intensely illuminated areas. 4. Indirect lateral illumination, in which the margin of the illuminated area is used. Such variations of ordinary focal illumination have all been put to practical service before the advent of the slit lamp; but it remained for this method, in the hands of enthusiastic students like Vogt, to reveal how much of histologic detail there was to be seen in this way.

This book is an atlas, in which these details are reproduced with some explanation of the significance of such representations. Most of the plates are in colors; and instead of the sheet of errata often placed in book to call attention to typographic errors, we have here such a slip pointing out where the reproductions of colors fall short of complete fidelity to the appearances of nature. Some 15 of the figures are thus subjected to correction, but the great majority of these figures need no correction.

The contents of the book are arranged in an introduction, the technic, methods of examination, and examination of the different tissues in this order; cornea, lens, iris and vitreous, and an appendix including the exami-

nation of the conjunctiva, eyelids, etc. There is a bibliography of the literature, and an index. The explanation of the figures given occupies four-fifths of the book, constituting a direct and practical guide to the student, who is attempting to understand what can be seen by this new assistant to vision. Some of the notes explaining the figures give detailed reports of the cases on which the observations were made.

Slit lamp microscopy has thus far been applied chiefly in the laboratory or as method of original research; but it will certainly be gradually brought into more general clinical use. Vogt points out that the manipulations of the apparatus are not easily acquired, but its successful application requires as much practice as the use of the ophthalmoscope. The high cost of the apparatus has also prevented the rapid adoption of the method. The ordinary coddington lens used as a magnifier gives an amplification of 10 to 15 diameters. The ordinary range for the corneal microscope is from 10 to 68 diameters, about 24 being most frequently employed. The value of the highest powers, 80 to 108 diameters, is lessened by the oscillations of the eyeball.

No one who wishes to become skilled in this method of examination can afford to work without this atlas. Indeed, one who desires only to become familiar in a general way with the advances of ophthalmic science in this direction will find this work a short, easy path to such knowledge. On all accounts it is a welcome addition to our resources. As might be expected of any English book brought out by a foreign language publisher, it is not free from typographic errors; nor is the translation always smooth and complete. But these faults are less in evidence here, than in some other works that have come to us in this way.

E. J.

**The Life of Jacob Henle.** Victor Robinson, M.D., Octavo, 117 pages, 4 plates. New York, Medical Life Publishing Co. 1921.

Henle (1809-1884) was a laboratory worker in histology, embryology and

physiology. Except as a student he never practiced any branch of medicine; and the state examination, which he took at Berlin, he felt to be a heavy burden, requiring, as it did, a knowledge of symptoms and treatment. Under the influence of Johannes Mueller, he early became interested in anatomy, human and comparative; and his dissertation submitted for the Doctorate in 1832 described for the first time the *membrana pupillaris*. His continued interest in the eye led to his descriptions of the histology of the retina (1839), the physiology of the lacrimal passages (1865), the fibers of the crystalline lens (1875), the structure of the lens (1878) and its development (1882). The lymph follicles of the palpebral conjunctiva are "Henle's trachoma glands." The limiting membrane of the choroid is the "membrane of Henle" or Bruch. The nerve fiber layer of the macula is "Henle's fibrous layer." Masses at the border of Descemet's membrane are "Henle's warts." He discovered (1852) that the yellow spot of the retina contained only cones.

Henle worked with Schwann in Mueller's laboratory; and in the epoch making joint contribution of Schleiden and Schwann to the foundation of the cell theory, Henle's work on the epithelium is the first citation by Schwann in support of the new claim that the cell is the most important tissue unit. There are good reasons that the picturesque, scientific and social career of Henle should be better known to American physicians, and particularly to ophthalmologists. He taught at Zurich, Heidelberg Goettingen, a source of strength to every faculty with which he was connected.

He was a progressive and liberal, sent to prison for a time for his connection with the radicals of his youth, and saved from the early eclipse of his career by the intervention of men like Humboldt. His social talents that brought him warm friendships, his love for music, his choice of Goettingen rather than Berlin, revealing his clear comprehension of the values of

life, are all dwelt upon in this biography in most interesting fashion.

Portraits of Henle, Kussmaul, Waldeyer and Mueller, all great anatomists of the nineteenth century, are here given. The text is admirably written, so that there is not a dull page in the book. Its condensed account of a great scientist and his useful life brings the reader in close contact with the formative stage of modern medicine. The excellence of this first biography of Henle to appear in English will give it a permanent place, in the broadly educational books that every member of our profession can read with profit, interest and recreation.

E. J.

**A Contribution to Brain Surgery—By V. Magnus, Christiania.** Paper, 138 pages, 14 charts of visual field, 2 plates, Christiania. Merkur Publishing Co. 1921.

The work is based on a surgical experience of 139 cases. There are many detailed case histories and final results are tabulated as follows:

(a) Diagnosis of brain tumor:—112 cases with 197 operations; cured, 12; marked improvement but with some defect remaining, 7; relieved of pain and with retention of sight during remainder of life, 48; deaths, 16; a mortality of 13.7% and an operation mortality of 8.1%.

(b) Trigeminal neuralgia, 31; cured, 30; no mortality.

(c) Epilepsy, 20 cases; 10 traumatic with 2 cures; 2 improved, 5 unchanged and 1 death. The 10 cases of genuine epilepsy were all unimproved.

(d) Miscellaneous. 7 cases.

Headache, vomiting and papillitis he finds the commonest early symptoms of cerebellar tumor. The headache appears either as frontal or occipital on the same side as the tumor. The earliest cerebellar symptoms are changes in gait, incoordination, and nystagmus to the same side as the tumor. The first focal sign usually appears as a reduced sensation in the parts supplied by the 5th nerve, noticed first in the corneal reflex on the side of the tumor.

There were 13 cases of tumor of the hypophysis. The very earliest visual disturbance in tumor of the hypophysis is a color defect in the upper temporal quadrant, which defect widens into a complete temporal hemiachromatopsia, while the field may yet be unimpaired for white. Then the white, too, fades in the temporal fields. The process affects both eyes, successively or simultaneously, giving a bitemporal hemiopia, which is characteristic of hypophyseal tumors. Atrophy of the optic nerve appears sooner or later. Papillitis is never present except late in the disease, and is then an evidence that the tumor has broken thru the diaphragm of the sella turcica and is occluding the foramen of Monro. Further growth often produces pressure on the 3rd, 4th and 5th nerves, causing paralysis of the eye muscles, and on the cavernous sinus giving exophthalmos. Radical extirpation was done in only one case. The author's treatment by preference is decompression on one or both sides followed by radiation.

Some of the conclusions of the author are:

Decompression should be done as soon as a diagnosis of cerebral tumor is made and a beginning papillitis appears.

In Jacksonian epilepsy and in traumatic epilepsy, an exploratory craniectomy should be done even if no papillitis is present.

A case of persistent injury of the head should be watched with the ophthalmoscope and, if swelling of the disc appears, a decompression should be done.

If the dura appears very tense at the time of operation, a puncture of a lateral ventricle should be done before the dura is opened.

Peripheral operations for trigeminal neuralgia are useless; if alcohol injections fail, either the Gasserian ganglion should be extirpated, or its pontine root torn out, preferably the latter.

The book gives evidence of careful and conscientious work. The author has been at a disadvantage in that he

has lacked specialized assistants, that he has often been compelled to work at different places and that all his cases have been private patients.

D. L. TILDERQUIST.

**The American Encyclopedia and Dictionary of Ophthalmology**, edited by Col. Casey A. Wood, M.R.C., U.S.A., M.D., C. M., D.C.L., assisted by a large staff of collaborators. Volume XXVIII. (See also v. 4, p. 938.)

We have now come to the end of the first edition of this stupendous work, which, however, will doubtless be followed by several additional volumes. Of the greatest interest in this recent volume are the three hundred pages on "War, Ophthalmic Medicine and Surgery In," by Lloyd Mills, of Los Angeles, who supplements his original essay on "Military Surgery of the Eye," published in Volume X, with this very complete essay, i.e., the former volume brought the subject up to 1917, and the present section carries it to 1921. A very complete resume is given of the organization of the ophthalmic service, particularly of the American and British armies.

War wounds and infections are further discussed. Gas Bacillus infections; tetanus; metastatic ophthalmitis; exogenous infections; other injuries of the eye, particularly intraocular foreign bodies; practical surgery; the problem of enucleation; sympathetic ophthalmitis—which in this war was exceedingly rare—injuries of the orbits and adnexa; the relations of military injuries of the skull and brain to ocular and visual disorders; psychoneuroses of war, malingering, the effects of asphyxiating, lacrimatory and vesicant gases in warfare; nightblindness, for which a new word, "hesperanopia," has been devised; the visual requirements of soldiers; the welfare of the war blind; the relation of the eyes to aviation, are all extensively entered into, excerpts being made not only from the literature of English speaking countries, but those of the various European nations and of Japan as well.

On the whole, this vast compendium of ophthalmic literature is a necessary part of the oculist's equipment and will be for a decade, for without doubt the managing editor, Colonel Casey A. Wood, had seen that nothing has been omitted and that the work of his many collaborators has been well orientated, and thus the series of eighteen volumes makes a complete whole. It is a monument to the indefatigable ardor, as well as the knowledge, of this master of ophthalmology, as well as to his coworkers, all of whom had otherwise placed themselves in the front ranks of scientific ophthalmology.

H. V. W.

**The Practical Medicine Series, Volume III, Series 1921. The Eye, Ear, Nose and Throat.** Edited by **Casey A. Wood, C.M., M.D., D.C.L.; Albert H. Andrews, M.D.; George E. Shambaugh, M.D.**

This little annual takes cognizance of only a portion of the leading articles having to do with practical clinical subjects. The editor notes that many essays of interest are yet based on military experiences. In addition, during the past year there have been a large number of papers on the ophthalmic relations of lethargic encephalitis, focal infections, and a number of other conditions, and considerable space has, for the sake of the general practitioner, been devoted to these captions. Aside from these subjects, a number of articles are noted on the hygiene of the eye and comparative ophthalmology, in addition to a general résumé of the ear, nose and throat, those of the interior ear, adenoids, tonsils and speech disturbance are of particular interest.

H. V. W.

**Bericht der deutschen ophthalmologischen Gesellschaft, Heidelberg, 1920.** Edited by the Secretary, A. Wagenmann. 406 pages, 66 illustrations. 1921, Munich and Wiesbaden, J. F. Bergmann.

This is the account of the forty-second meeting of this organization. Two years have passed since its last preced-

ing meeting, this being the first held since the cessation of hostilities. Like its predecessors, this volume gives chiefly rather brief communications, with abstracts of such discussions as they provoked. A group of a dozen papers deal with points of anatomy and physiology, especially the anatomy of the anterior chamber, the constitution of the aqueous humor, and especially its constitution in glaucoma.

Among the practical papers, that by Brandt, narrating the experiences at Heidelberg with Elliot's trephining for glaucoma, awakened the most general discussion, 20 speakers. Corneal herpes has furnished a subject for investigation on the part of Grueter and Loewenstein. E. Fuchs gives a note on senile changes in the optic nerve, and Igersheimer on the value of tuberculin therapy. Pfluegk gives a historical sketch on glasses mounted in scissors fashion. Altogether, there are 43 such scientific papers, of which less than half seem to have given rise to any discussion.

An important part of the volume is the account of the demonstrations, given at a special session by 21 of the members. These include pathologic and other specimens, instruments, apparatus, tests and graphic representations of results obtained in various investigations. There are also minutes of the meeting, speeches of various presiding officers, which contain allusions to "German Science" and "German Ophthalmology," and a list of members from which we gather that 135 attended this meeting.

This list contains the names of several Americans who have been dead for various periods; as Hasket Derby 7 years, George Strawbridge 7 years, C. F. Wadsworth 10 years, and Charles J. Kipp 11 years. Among the English names we note those of Nettleship, who died in 1913, and Angus McNab, whose tragic death in 1914, while trying to give relief to the wounded, is one of those incidents of war that are not easily forgotten by those who appreciated his work and his promise.

E. J.

## CORRESPONDENCE.

## Title Page Dates Versus Copyright Dates.

*To the Editor:* Under our laws he who first sends to the Librarian of Congress two printed or typewritten copies of the title page of a proposed publication, accompanied by the legal fee, is given a copyright—no matter whether he be or be not the author of the proposed publication. It is left to the courts to decide, in cases of alleged fraud, who is the real owner. It is a case of the one being served first who comes first. Perhaps this is the appropriate as it is the expeditious way of handling a vast amount of business.

The aggrieved party has a show for justice. But what is the status of an author who, having permitted his publisher to obtain the copyright, finds that the child of his (the author's) brain has been placed in the class of illegitimates?

Suppose, for example, that a well-known book on ophthalmology was last printed in the year 1916; suppose that five years later, a sharp publisher, having on hands a few copies, and desiring to sell them quickly, should bind the printed sheets and should place in the volume a title page dated 1921. What recourse does the author have?

The glib salesman can tell the prospective buyer that "this is the last edition." Of course it is, for the author has not yet forwarded the manuscript for the new one.

What recourse has the author? None! His best friends may revile

him, for they are ignorant of the facts. They may write him letters so full of sulphur and phosphorus that the recipient wonders that they do not burn the mail bags. What can the poor devil do? Only this: try to smile (*risus sardonicus*)—and he can do one thing more:

He can tell the members of his profession never to buy a book on the strength of the date printed on the title page, for it is only the copyright date that counts. That is the legal and actual date of the year of publication.

It is a pity that authors should be humiliated by the practices of unscrupulous publishers. And it is deeply to be regretted that publishers who obtain money by false pretenses are not inhabiting that sphere of limited bounds, where "big ones are broken into little ones."

JAMES MOORES BALL.

St. Louis, Mo.

## PROF. FUCHS IN ST. LOUIS.

*To the Editor:* The Ophthalmic Section of the St. Louis Medical Society announces a course of lectures in Ophthalmology, to be given in St. Louis by Professor Ernst Fuchs of Vienna during the month of February, 1922.

Further information regarding this course may be obtained by writing to the Fuchs Lecture Committee, St. Louis Medical Society, 3525 Pine St., St. Louis, Mo.

E. J. GOODWIN.

## ABSTRACTS

**Hagen, S. Serous Postoperative Detachment of Choroid.** *Klin. M. f. Augenh.* v. 66, 1921, p. 161.

Hagen made, during 9 months, a systematic investigation in the eye clinic of Prof. Schiötz on the serous post-operative detachment of the choroid. Besides the ophthalmoscope, he found the transillumination the most useful for diagnosis, where the former failed. If around the illuminating point the sclera shows light, it signifies that the choroid is detached from it by serous fluid. He found the detachment most frequent after Elliot's operation, in 41 cases, i.e., 76%, after cataract extraction in 13 cases, 22%, and concludes thus: The escape of aqueous from the opening of the anterior chamber is for the most part replaced from the vitreous. If this continues, as after Elliot's operation or fistula of the cornea, the vitreous must finally lose considerably in volume, so that the pressure on the choroid is diminished and a traction exerted on it, leading to detachment. The gap is rapidly filled with transudation from the engorged large choroidal vessels. It occurs only in older persons with rigid sclera. The youngest patient was 34 years. After closure of the fistula, the choroid was reattached. It lasts scarcely 3 weeks and gives a good prognosis, seldom requiring treatment. Puncture of the sclera is not rational. The pigment streaks that sometimes remain are probably caused by a proliferation from the pigment epithelium at the folds of the angle of the detached portion.

C. Z.

**Fleischer, B., and Ensinger, T. Homonymous Hemianopsia After Gunshot Injury of the Skull, Especially the Occiput.** *Klin. M. f. Augenh.*, v. 65, 1920, p. 181.

The authors report on 67 cases under the following headings: (I) Unilateral and chiefly unilateral hemianopsia; (a) right sided hemianopsia; 1. Merely right sided hemianopsia. 2. Chiefly right sided hemianopsia with participa-

tion of the left half of the visual field. 3. Right sided quadrant hemianopsias. (b) Left sided hemianopsias with the corresponding subdivisions.

(II) Bilateral hemianopsias; (a) inferior hemianopsias; 1. Pure inferior hemianopsia. 2. Chiefly inferior hemianopsia with participation of the upper field; (b) superior hemianopsias.

(III) Hemianopic scotomas; (a) Central Scotomas; (b) Paracentral scotomas extending to the point of fixation; (c) Scotomas outside of the macular region. All are illustrated by charts of the visual fields.

With regard to principal questions, the intactness of the macula was found 27 times, its participation 5 times. These phenomena are differently explained by different authors. Case twenty-seven, with injury of the posterior pole of the brain and intactness of the macula, spoke for the theory of Levy of the double supply of the macula. Case ten made this explanation superfluous because a later examination disclosed an improvement in the form of a peripherally progressing recovery of the macular region. The starting point for a peripherally progressing regeneration must certainly be sought in an intact macular region of the same side. Otherwise the assumption of double supply is rendered improbable by the occurrence of central hemianopic scotomas and of the circumscribed scotomas of the macular region extending into the point of fixation. The disappearance of the macular quadrant after operative removal of the projectile is not compatible with a double supply, as here the adjoining macular center towards the pole or the corresponding fibres were damaged by the extraction.

An encroaching of the defect upon the intact visual field in the macular region occurred in cases 15 and 16. In both, according to the seat of the injury, a destruction of both macular centers is easily intelligible.

C. Z.

**Pick. Blindness of New Born Child from Instillation of Wrong Drops.** *Klin. M. f. Augenh.*, v. 66, 1921, p. 485.

A midwife instilled into the eyes of a newborn child some drops of supposed 1% solution of nitrate of silver. Immediately the child screamed from intense pain for 2 hours, when the parents noticed at the place of the eyes glassy gelatinous formations in the orbits, which were the excessive, enlarged, thinned cornea. Both eyes were destroyed. As the same drops had caused intense irritations in two previous cases, the solution was sent to a druggist who stated that it was labeled 10% nitrate. Then it was thrown away and no further examination was possible. Pick made experiments on young rabbits with a 10% solution of nitrat of silver, 10% sodium hydrat, and carbolic acid. The eyes treated with 10% sodium hydrat and carbolic acid were lost within a week from phthisis after perforation of the cornea. The 10% nitrate of silver caused an intense diffuse opacity of the cornea, but the anterior chamber and deeper parts remained intact.

C. Z.

**Kummell, R. Injury of Cornea by Roentgen Rays.** *Klin. M. f. Augenh.*, v. 66, 1921, p. 480.

Kummell observed after Roentgen radiation diminished sensibility of the cornea, in one case to such an extent that the cornea could be indented without eliciting defensive movements, also of the other branches of the fifth nerve. Twice the intraocular pressure was transiently increased.

Kummell then relates the further facts of the child, aged  $3\frac{1}{2}$  years, with glioma of the retina, reported in 1918 at Heidelberg. Roentgen rays had undoubtedly very much influenced the glioma, as shown by the recession and reattachment of the retina and recurrence of a slight pupillary reaction to light. But new nodules occurred, which healed with radiation, leaving only one at the last examination. The child, however, died after a month from pneumonia. An autopsy was not granted.

C. Z.

**Sunseri. Proteolytic Ferments in Ocular Diseases Investigated by the Abderhalden Method.** *Arch. di Farmac. Sperimentale*, v. XXX, Oct. 15, 1920, p. 127.

The therapeutic basis of the Abderhalden method may be summed up in the author's words. "Each organism which is the seat of a pathological process undergoes a disintegration of its own specific tissue, this protein thrown into the blood stream causes the appearance in the blood of a ferment destined to break it down." Sunseri reviews the literature of the reaction as it has been applied to ophthalmology, especially in the case of cataracts. Von Hippel, Frenkel and Nicolas have found that the blood serum in cases of cataract shows no proteolytic substances for lens protein. Von Hippel and Hegner both obtained a fair number of positive results in sympathetic ophthalmia. Frenkel, Nicolas and Ficher obtained only negative results with uveal proteins in cases of irido-cyclitis. The author emphasizes the need of observing an exact technique in order to obtain dependable results and describes in detail his technique for preparing the "sub-strate" or proteid which is to be digested and of testing the serum of patients for the ferments which will digest it. The author's results are as follows:

**Lens**—The serum of four patients with traumatic cataracts out of five cases tested showed a ferment specific for lens protein. Of 32 cataracts of other varieties, mature and immature, only eleven showed this specific ferment. Three of these which had been positive became negative some weeks after cataract operation, which is fairly strong evidence that a specific antibody had been present. Of eleven normal sera, only two were weakly positive. These positives in normal sera may be explained as the development of a ferment, not for lens protein but for an identical protein derived from tissues elsewhere in the body. Traumatic cataracts were produced in fourteen rabbits and eleven of these rabbits gave positive reactions in their serum. Six of these were reexamined after the cataractous eye had been removed and five gave negative results on the third day after the

operation. Four normal rabbits gave negative reactions. Reactions to choroidal protein were negative in two trials so the reaction was evidently specific for lens protein. The aqueous removed from three of these rabbits with traumatic cataracts showed no specific ferment, but probably the amounts present in aqueous are too small to be detected. The author suggests the interesting possibility of injecting these cataractous animals with increasing doses of lens substance in order to observe whether any increase in the ferments occurs and whether any effect is produced on the absorption of the cataract.

**Cornea**—Using macerated cornea as sub-strate, the serum of twenty cases of various kinds of keratitis were tested and only five gave positive reactions. Two were interstitial keratitis, one was a healed ulcer, one recurrent keratitis and one hypopion ulcer. This agrees with Bernaud's results which showed a fair number of positives in interstitial keratitis and a very small number in other diseases of the cornea. Keratitis was artificially produced in five rabbits and serum in four of these gave positive reactions, two becoming negative after enucleation.

**Uveal Tract**—Of nine cases of choroiditis, four gave positive reactions to choroidal protein. Three of these were ruptures of the choroid and one was luetic choroiditis. Two cases of suppurative iritis were positive while other forms of iritis were negative. No results were obtained which would have any bearing on the origin of glaucoma. Of seven cases of sympathetic ophthalmia, one was positive and the other was negative. Negative results to retinal protein were obtained in retinitis pigmentosa, albuminuric retinitis, and luetic retinitis. The most interesting result was obtained in two cases of tumor. A case with a conjunctival epithelioma showed a positive reaction to conjunctival protein and one with a choroidal tumor was positive for the choroid.

The author concludes that the method does not lend itself to practical diagnosis or prognosis. In traumatic processes of any part, a positive reaction is nearly al-

ways present. In non-traumatic processes, it is nearly always present because of the small amount of metabolic products drawn into the circulation. It has no prognostic value in traumatic cases. It is usually negative in luetic processes. Reactions in cases of tumor seem to offer favorable results and further work is desirable on this subject.

S. R. G.

**Fuchs, A. Pathogenesis and Anatomy of Cysts of the Retina.** (With 19 figures in the text.) Graefe's Arch. fuer Ophthal. 105, p. 333.

The author does not consider cysts of the retina clinically important, as ophthalmoscopic proof is almost impossible on account of technical difficulties. They appear generally in eyes which, either in the course of a severe inflammation or subsequent detachment of the retina, become blind and which succumb to secondary intraocular pressure.

He examined 99 eyeballs with cysts of the retina. In 55 cases there existed a detachment of the retina without glaucoma; in 15 cases retinal detachment was associated with glaucoma. In 20 cases, which were enucleated for secondary glaucoma, the retinas were in apposition.

Fuchs does not consider the "cysts" as true ones, in a pathologic-anatomic sense; as these cavities within the retina are not lined with epithelium. They are small cavities within the tissues of the retina thru enlargement of small folds filled with fluid, either rich or poor in albumin, the walls of which consist of retinal tissue, which is at times more or less dense. He designates these pseudocysts, cavities which originate thru gluing together of retinal folds.

In the majority of cases we can prove the mechanical origin of the cyst formation. In the following, he divides the cysts into groups according to their mechanical formation. As many cases show a manifold mechanical origin, it becomes difficult to put them in a group.

I. Cyst formation on the outer side

of the retina with detachment and retinochoroidal synechiae.

II. Cyst formation on the inner side of the retina, produced by pulling or stretching bands.

III. Thru shrinking of the retina.

IV. Cysts with secondary glaucoma and the retina in apposition with the choroid.

V. Cysts occurring with tumors of the choroid.

He concludes, that even if all these formations have no special clinical signification, the study of their origin is worth while, because the influence of the mechanical power on the pathologic processes of the retina are shown.

H. A.

**Gabrielides, A. Etiology of Vernal Conjunctivitis.** *Ann. d'Ocul.* 1920, v. 157, p. 282.

The author refers to previous articles, in which he laid stress on the presence of eosinophiles in the conjunctival secretion, the tarsal granulations, and the peripheral blood, and the occurrence of the disease in several members of a family. Since then, bacteriologic study has revealed nothing of importance. Study of the blood of 18 patients, however, has shown 7.72% eosinophiles in the peripheral circulation and 7.05% in the blood taken locally, from the vegetations. The presence of these cells is a defense reaction of the body against certain bacteria, parasites, worms or organic cells.

The familiar quality of the disease is shown by its presence in at least two members of each of the 13 families, whose histories are given. Certain facts have been observed—no husband ever infected his wife or vice versa; no servant, nurse or visitor was ever infected. Only children, as a rule were affected, but no child infected its parent, and when the parent was previously affected, the child usually resembled in physical characteristics the affected parent. From the above considerations, the author concluded that the disease was not a microbic affec-

tion. Experiments on an ape and two children showed that direct inoculation was impossible. Microbes, parasites and worms were excluded by careful examination of the secretions and excretions of the patients.

Investigation by others has shown that the rays of the sun are a secondary rather than a primary cause of the disease. The author believes that an atmospheric change, probably electrical, rather than the sun's rays, is the cause, in persons predisposed to the disease thru an autointoxication.

C. L.

**Kleefeld, G. Sulfarsenol in Ophthalmology.** *Ann. d'Ocul.* v. 157, 1920, p. 428.

This drug is a methylsulphur derivative of salvarsan, in the form of a yellowish powder. The advantages claimed for it are that it is very soluble and the solutions are practically unaffected in the air. Its toxicity is one-half, and its potency is twice that of neosalvarsan. It can be used for intramuscular injections; and if the fluid spreads around the vein, it produces neither induration nor sloughing. Intramuscular injection is slightly painful, but there are never untoward symptoms. The Bordet-Wassermann test frequently becomes negative in a very short time in primary syphilis.

The author treated a dozen cases of specific iritis, some with condylomata, with intravenous injections every two days. The first injection was always followed by an amelioration. In 15 days the condylomata had disappeared. The retrogression of the lesions were watched by the corneal microscope and Gullstrand's illumination. A case of specific neuritis was not affected by the treatment. Parenchymatous keratitis varied in its response to the drug. Chronic syphilis was very little affected by the treatment, but infantile syphilis responded very readily. Scrofulous ophthalmia also was very favorably influenced.

C. L.

## NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply the news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. Geo. H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph C. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu; Dr. E. B. Cayce, Nashville, Tenn. Volunteers are needed in other localities.

### DEATHS

Dr. A. Casali, Professor of Ophthalmology at the University of Florence, died recently.

Dr. Henry C. Shutte, West Plains, Missouri, died October twelfth, in Chicago, from a carcinoma of the throat, aged sixty-three.

Dr. Frances P. Sprague, of Boston, died at the age of eighty-eight. He was a veteran of the Civil War, formerly a surgeon at the Massachusetts Charitable Eye and Ear Infirmary, and a member of the American Ophthalmological Society.

### PERSONALS

Dr. P. J. H. Farrell has been elected Commander of the Chicago Chapter of Military Order of the World War.

Dr. Alexander Duane, of New York City, has been chosen Chairman of the Graduate Council of Union University.

Dr. S. Lewis Ziegler gave a dinner at his suburban home at Haverford, October 17th, in honor of Professor Van der Hoeve of Holland.

Dr. L. Webster Fox, of Philadelphia, gave a dinner to Professor Fuchs, on Wednesday evening, October nineteenth.

At the October meeting of the Philadelphia Medical Club, Dr. Paul Sartain was nominated for Second Vice-President.

Dr. Julio Senior, an ophthalmologist of San Domingo, has returned to his home after spending some time in the United States.

Dr. Homer E. Smith, of New York, has resigned from the board of medical governors and as visiting ophthalmologist to the New York Diagnostic Clinics.

Dr. Ring, of Philadelphia, spent the early part of September as the guest of the Anglo-American Fish and Game Club of Canada. The month of September is said to mark the best trout fishing in those waters.

Dr. Theodore Dimitry, Professor of Ophthalmology at Loyola University, and Chief Visiting Ophthalmologist to Charity Hospital of New Orleans, has been elected President of the Visiting Staff of Surgeons and Physicians to this hospital.

A number of well known ophthalmic surgeons of Philadelphia, reached home during September and October, having spent their summer and early fall in Europe. Among them were, Dr. Howard Forde Hansell, Dr. S. Lewis Ziegler, Dr. Wm. M. Sweet and Dr. Burton Chance.

Dr. Melville Black of Denver has been made Professor of Ophthalmology and head of the department in the University of Colorado Medical School, as successor to Dr. Edward Jackson, who has been made Professor of Ophthalmology, Emeritus.

A letter from Dr. John O. McReynolds, of Dallas, tells us that thru his personal solicitation Dr. Barraquer, of Barcelona, and Col. Elliot, of London, have promised to accompany him on a tour of some of the larger cities of this country, just preceding the meeting of the International Congress in Washington.

Dr. Luther Peter of Philadelphia, Chairman of the Eye, Ear, Nose and Throat Section of the Medical Society of the State of Pennsylvania, gave a dinner at the Union League, on Wednesday, October fifth, to Professor Van der Hoeve, who was his guest during his stay in Philadelphia. Professor Van der Hoeve visited America in response to an official invitation of the American Academy of Ophthalmology and Oto-Laryngology.

Dr. George E. de Schweinitz, of Philadelphia, returned early in November from China, where he represented the University of Pennsylvania at the ceremonies attached to the installation of the Director of the Peking Union Medical College. He went also as one of a committee of the Rockefeller Foundation of Medical Research; and delivered one of the formal addresses at the installation ceremonies. At a reception given by University of Pennsylvania graduates to General Wood, Provost of the University, absent on leave for one year, Drs. de Schweinitz, Dr. Harvey J. Howard, and Dr. T. M. Li (1908) took an active part.

### COMING MEETINGS

International Congress of Ophthalmology, Washington, D. C., April 25-28.

American Ophthalmological Society, Washington, D. C., May 1-3.

Section on Ophthalmology, American Medical Association, St. Louis, May 22-26.

Oxford Ophthalmological Congress, Keble College, Oxford, England, July 5, 6, 7, 8.

American Academy of Ophthalmology and Oto-Laryngology, Minneapolis, September 19-21.

#### SOCIETIES

The 1922 meeting of the American Academy of Ophthalmology and Oto-Laryngology will be held in the Twin Cities of St. Paul and Minneapolis, Minnesota, September 19-21 inclusive. This will be followed by a three days' course section on instruction, September 22-24 inclusive, 1922. Preceding the regular meeting will be held the examinations in Ophthalmology and Oto-Laryngology by the Examining Board. Dr. Horace Newhart is Chairman of the Local Committee.

The recent annual meeting of the American Academy of Ophthalmology and Oto-Laryngology, which was held in the Bellevue Stratford Hotel in Philadelphia, was considered the most successful in its history. The attendance was very large and enthusiastic.

At the December meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, Dr. Edward Martin, Commissioner of Health of Pennsylvania, discussed the subject: "Does the status of Ophthalmia Neonatorum in Pennsylvania point to the need of Prophylactic Legislation?" Dr. Martin has investigated the subject with discriminating care, and his pronouncement will be looked upon with great interest.

At the December 15th meeting of the Section on Ophthalmology of the College of Physicians of Philadelphia, papers were read by Dr. S. Lewis Ziegler on "Complete V-Shaped Incision for Pyramidal and Zonular Cataracts;" by Dr. T. B. Holloway, Clinical Cases, "Plastic Operation of Lid," "Cicatrical Entropion," and "Amaurotic Family Idiocy"; Dr. G. Oram Ring, "Pulsating Exophthalmos, Ligation of Carotid"; Dr. H. M. Langdon, "Keratitis Profunda Treated by Radiant Heat from Thermophore of Shahan"; Dr. Edward Martin, "Shall Pennsylvania Make Compulsory the Application of Silver Nitrate to the Eyes of Newly Born?"; and Dr. G. E. de Schweinitz, "Types of Toxic Amblyopia with Illustrative Cases."

The October meeting of the Ophthalmic Section of the College of Physicians of Philadelphia, was marked by the presence of Professor E. Fuchs of Vienna, and Professor J. Van der Hoeve of Leiden, Holland. The former gave a lantern demonstration upon "Senile Changes in the Optic Nerve," and the latter, a lantern demonstration upon "The Development of the Lacrimal Canal in Normal and Abnormal Conditions." A cordial appreciation of the distinguished guests was given by Dr. G. Oram Ring, Chairman of the Section.

The discussion upon Professor Fuchs' demonstration was opened by Dr. Edward Jackson of Denver, Colorado; and that upon Professor Van der Hoeve's demonstration by Professor J. Parsons Schaeffer of Jefferson Medical College.

Previous to the Section Meeting, a dinner of thirty covers was given the foreign guests by Dr. Ring, at the Union League.

#### MISCELLANEOUS

A new Eye, Ear, Nose and Throat Hospital will be erected in New Orleans at a cost of approximately \$350,000.

The Manhattan Eye and Ear Hospital was recently bequeathed \$10,000 by the will of Mrs. Jemina S. Simms.

The Chapin Memorial Home for the Blind, Philadelphia, was left \$10,000 under the will of Emily Dutilleul.

The Minneapolis Civic and Commercial Association has been making a study of street lighting, and has recently made a report with recommendations for installing an efficient, economical and artistic lighting system in Minneapolis.

Connecticut has passed a law making it compulsory to report within six hours the presence of disease in the eyes of the newborn baby. The state furnishes a prophylactic for use in the newborn for physicians and midwives.

Mrs. Duncombe of London, founder of the Guild of Blind Gardeners, who is herself blind, says she can tell different flowers by the sense of touch. Blind gardeners have been known who could tell the different types of roses by touch alone, where to other blind people scent was the chief guide.

The first examination of the National Board of Medical Examiners, Parts I and II, under the new plan, will be held as follows:

Part I, February 15, 16 and 17 (1922) inclusive.

Part II, February 20 and 21 (1922) inclusive.

Applications for examination should be received not later than January 15, 1922. Application blanks and circulars of information may be had by writing to the Secretary, Dr. J. S. Rodman, 1310 Medical Arts Building, Philadelphia, Pa.

September, 1922, an ophthalmologic course will be held at the No. 1. Royal Hungarian University Eye Clinic. Besides lectures and demonstrations, by the representatives of ophthalmologic therapeutics, kindred subjects will be presented by University Professors of Anatomy, Physiology, Internal Medicine, Surgery, Dermatology, Laryngology, etc.

A detailed program will be issued early in 1922. Particulars will be furnished by the Director No. 1. Royal Hungarian University Eye Clinic, Budapest, VIII. Máriáutca 39. Emile de Grósz, Professor.

The Hoover Committee for the Elimination of Waste in Industry finds that more than fifty per cent of the men and women employed in American industry are suffering from defective vision. The report was prepared by Herbert Hoover, Secretary of Commerce, and seventeen engineers who worked with him, and is being issued by the Federated American Engineering societies, under whose auspices the gigantic survey was undertaken. L. W. Wallace, Vice-Chairman of the Committee, in an advanced synopsis, estimates that twenty-five million workers have defective vision requiring correction.

The New York State School for the Blind, at Batavia, has made its annual report for the past fiscal year. Dr. F. Park Lewis is President of the Board. The number of inmates totaled 181, of whom 102 were boys and 79 girls. The causes of blindness were as follows: Ophthalmia neonatorum, 36; optic atrophy, 37; congenital cataract, 26; congenital amblyopia, 14; hydrophthalmus, 6; leucoma, 8; cataracts, 7; traumatism, 6; sympathetic ophthalmia, 4; corneal opacities, 7; choroiditis, 3; interstitial keratitis, 3; detached retina, 2; microphthalmus, 2; neuroretinitis, 2; phlyctenular keratitis, 1; myopia and choroiditis, 1; panophthalmitis, 1; choroiditis and microphthalmus, 1; retinitis pigmentosa, 1; congenital malformation, 1; congenital lack of development, 1; glaucoma, 1; microphthalmus-hydrophthalmus, 1; keratitis, 1; iritis, 1; choroiditis with optic atrophy, 1; uveitis, 1; phthisis bulbi, 1; nebula of cornea, 1; iridocyclitis, 1; not diagnosed, 2. During the past year 33 new pupils were admitted. Their causes of blindness were as follows: Optic atrophy, 10; corneal opacities, 7; secondary cataract, 2; congenital cataract, 2; neuroretinitis, 2; panophthalmitis, 1; congenital lack of development, 1; phthisis

bulbi, 1; congenital amblyopia, 1; retinal degeneration, 1; retinochoroiditis and corneal opacities, 1; choroiditis and optic atrophy, 1; congenital cataract and progressive myopia, 1; congenital dislocated lens and optic atrophy, 1; traumatism and sympathetic ophthalmia, 1.

It is to be noted that ophthalmia neonatorum does not enter into the causation for the pupils admitted this year; but that it does stand as the cause in twenty per cent of the total number of inmates.

The Kansas City Eye, Ear, Nose and Throat Society held its regular monthly clinic meeting at St. Margaret's Hospital, Kansas City, Kansas, and Bell Memorial Hospital, Rosedale, Kansas, with about 50 in attendance.

Dr. H. W. Woodruff of Joliet, by invitation, operated upon twelve cases, four cataracts, four muscle cases (on two of which he did his tendon tucking operation with his new tendon tucker), one Elliot for glaucoma, one Haitz for entropion, one tear sac extirpation and one iridectomy for total occlusion of pupil. At noon time St. Margaret's Hospital tendered the visitors a buffet luncheon. At the Bell Memorial Hospital, Dr. Sam Roberts of Kansas City gave an ear, nose and throat clinic.

In the evening a dinner was held at the Muehlebach Hotel. Dr. Woodruff gave a moving picture demonstration of his operation for paralytic squint, also tucking operation for squint. The subject was discussed by Dr. R. J. Tivnen of Chicago. A report of the cataract cases operated by Colonel Smith on his June visit in Kansas City was made by Dr. J. W. McKee.

The Society is made up of ophthalmologists and otolaryngologists from Missouri, Kansas, Oklahoma and Arkansas.

## Current Literature

These are the titles of papers bearing on ophthalmology received in the last three months. Later most of them will be noticed under Digest of the Literature. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically usually by the author's name in **heavy-face type**. The abbreviations mean: (Ill.) illustrations; (Pl.) plates; (Col. Pl.) colored plates. Abst shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper. Under repeated titles are given additional references to papers already noticed. To secure early mention copies of papers or reprints should be sent to 318 Majestic Building, Denver, Colorado.

### PHYSIOLOGIC OPTICS.

- Adam, C. Apparatus for examining stereoscopic pictures. Heidelberg Opth. Congress, 1920, p. 343.
- Coblentz, W. W. Characteristics of radiation from quartz mercury lamps. Amer. Jour. Electrotherap. and Radiol., v. 39, 1921, pp. 395-408.
- Kroencke, K. Phenomena of visual space. Zeit. f. Psychol. u. Phys. d. Sinnes., v. 52, 1921, pp. 217-228.
- Seidel, E. Physiologic secretion of intra-ocular fluids. Ber. d. deut. ophth. Gesell., v. 42, 1920, pp. 50-55.
- Tschermak, A. Exact subjectivism in new physiology of senses. Pfüger's Arch. f. d. g. Phys., v. 188, 1921, pp. 1-20.
- Weiss, E. How do loupes and glasses magnify for eye. Deut. opt. Woch., v. 7, 1921, pp. 143-145.

### DIAGNOSIS.

- Berger, E. New model of stereoscopic loupe. Zent-Zeit. f. Opt. u. Mech., v. 42, 1921, pp. 325-327.
- Byers, W. G. M. Eye as signal of disease. Canadian Med. Assn. Jour., v. 11, 1921, pp. 811-813.
- Dameno, E., and Barassi, A. Ophthalmoscopy in green light. (2 ill.) La Prensa Med. Argentina, v. 8, 1921, p. 158.
- Eicken, v. New binocular loupe for endoscopy. Heidelberg Opth. Congress, 1920, p. 329.
- Ferre, C. E., and Rand, G. Illuminated perimeter with campimeter features. (Dis.) A. J. O., v. 4, 1921, p. 924.
- Greene, A. Mercantile marine vision tests. Brit. Jour. Ophth., v. 5, 1921, p. 572.
- Groethuysen. Relation of motor and visual differential sensibility in disease of visual organs. Heidelberg Opth. Congress, 1920, pp. 255-257.
- Hegner, C. A. Reading card for sight testing. Heidelberg Opth. Congress, 1920, pp. 340-342.
- Jones, L. W. Method of measuring nyctopsia with results. Brit. Jour. Psych., Gen. Sec., v. 11, 1921, pp. 299-319.
- Koeppel, L. Use of "bitumi" with slit lamp illumination. (4 ill.) Heidelberg Opth. Congress, 1920, pp. 322-329.
- Loehlein, W. Psychic factor in testing vision of small children. (2 ill.) Heidelberg Opth. Congress, 1920, pp. 345-352.
- Distance in estimation of visual acuity. (Dis.) Heidelberg Opth. Congress, 1920, pp. 258-261.

- Passow, A. Rheostat for use with ophthalmoscope. Heidelberg Opth. Congress, 1920, pp. 343-344.

### THERAPEUTICS.

- Butyn, J. A. M. A., v. 77, 1921, p. 1891.
- Franke, E. Injury to visual organs thru eukupin. (Dis.) Heidelberg Opth. Congress, 1920, pp. 177-180.
- Goldschmidt, M. Experimental contribution to optochin therapy. Heidelberg Opth. Congress, 1920, pp. 173-177.
- Haan, L. B. de. Protein therapy in Ophthalmology. Nederl. Tijdschr. v. Geneesk., 1921, ii, p. 1421. Abst. J. A. M. A., v. 77, 1921, p. 1934.
- Passow, A. Dosage and technic of radiations with Bach's quartz lamp in relation to injury and therapeutics. (1 ill. Dis.) Heidelberg Opth. Congress, 1920, p. 307.
- Seefelder, R. Radiotherapy of human eye. Heidelberg Opth. Cong., 1920, p. 307.

### OPERATIONS.

- Brana, J. Lid retractor; trachoma knife. Orvosi Hetil., v. 65, 1921, p. 276.
- Repeated Titles. Kubik, J. (O. L., v. 17, 1921, p. 944). A. J. O., v. 4, 1921, p. 944.

### REFRACTION AND ACCOMMODATION.

- Dameno, E. Prisms and decentration of lenses. Prensa Med. Argentina, v. 8, 1921, p. 125.
- Diagnosis, diseases and therapeutics of ametropia. Amer. Med., v. 16, 1921, pp. 597-605.
- Hoor, K. v. Dangers of hyperopia and myopia. Orvosi Hetil., v. 64, 1920, pp. 13-16.
- Olsho, S. L. Multifocal lenses. A. J. O., v. 4, 1921, p. 923.
- Paparccone, E. Monocular diplopia and traumatic myopia. Gior. di Med. Ferrov., v. 1, No. 5, 1921, pp. 212-219.
- Thomasson, W. J. Causes and treatment of headache. Kentucky Med. Jour., v. 19, 1921, p. 829.
- Weiss, E. Spectacle glasses for presbyopes and amblyopes. (3 ill.) Heidelberg Opth. Congress, 1920, pp. 282-287.

### OCULAR MOVEMENTS.

- Duverger, C., and Barré, J. A. Associated movements of eyes in tabes, Parkinson's disease, epidemic encephalitis and labyrinthine disease. Rev. Neur., v. 28, 1921, pp. 439-454.

- Koellner. Localization of direction and its significance in habits of one eyed. Heidelberg Ophth. Congress, 1920, pp. 142-145.
- Lafon, C. Nystagmus and nystagmoid movements. Jour. de Méd. de Bordeaux, v. 92, 1921, pp. 374-376.
- Lopes, L. F. Toxic meningitis with ophthalmoplegia. Brazil Med., v. 35, p. 231.
- Parsons, J. H. Fourth cranial nerve. (8 ill. Bibl.) Brit. Jour. Ophth., v. 5, 1921, pp. 529-543.
- Pollack, W. B. I. Early operation in convergence strabismus. Brit. Med. Jour., Nov. 5, 1921, p. 733.
- Seelye, W. K. Management of squint in children. Northwest Med., v. 20, 1921, pp. 332-335.
- Ziegler, S. L. Capsulomuscular advancement without incision. (Dis.) A. J. O., v. 4, 1921, p. 921.
- Repeated Titles. Lafon. (O. L., v. 17, 1921, p. 110.) A. J. O., v. 4, 1921, p. 942.

## THE CONJUNCTIVA.

- Blaskovics, L. v. Teal's conjunctival plastic operation. Orvosi Hetil., v. 65, 1921, p. 275.
- Buerger, M. Conjunctival edema. Ergebn. der inn. Med. u. Kinderheill., v. 18, 1920, pp. 189-238.
- Coppez, H. "Frothy" conjunctivitis. Bruxelles Méd., June 15, 1921.
- Cumston, C. G. Antiquity of trachoma. Brit. Jour. Ophth., v. 5, 1921, p. 559.
- Ferriell, J. R. Follicular conjunctivitis or trachoma? A. J. O., v. 4, 1921, p. 918.
- Gaston, I. C. Trachoma. Northwest Med., v. 20, 1921, pp. 335-338.
- Ito, S. Bacillus pyocyaneus infection of conjunctiva and cornea. Japan Med. World, Sept., 1921, p. 21.
- Kartal, A. Methods and results of conservative treatment of trachoma. Orvosi Hetil., v. 65, 1921, p. 275.
- Kiehle, F. A. Phlegmon of conjunctiva following pterygium operation. (1 col. pl.) A. J. O., v. 4, 1921, pp. 881-883.
- Kleinschmidt, H. Is there phlyctenulosis without tubercular infection? Beitr. z. Klin. d. Tuberkul., v. 48, 1921, pp. 188-194.
- Noguchi, C., and Kyoze, M. Forms of cells occurring in secretions of eyes. Sei-Kwai Zasshi, May, 1921.
- Pattee, J. J. Phlyctenular conjunctivitis. (Dis.) A. J. O., v. 4, 1921, p. 929.
- Uhthoff, W. Tarsal conjunctiva with calcareous deposit after vernal conjunctivitis. Heidelberg Ophth. Congress, 1920, p. 309.
- Repeated Titles. Lindner, K. (O. L., v. 17, 1921, p. 410.) A. J. O., v. 4, 1921, p. 943.

## THE CORNEA AND SCLERA.

- Axenfeld, T. Posterior embryotoxon of cornea. Heidelberg Ophth. Congress, 1920, pp. 301-302.

- Blegvad, O., and Haxthausen, H. Blue sclerotics with fragile bones. Hospitalstid., v. 64, 1921, pp. 609-645. Abst. J. A. M. A., v. 77, 1921, p. 1934.
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- Clausen. Keratoconus and its treatment. Heidelberg Ophth. Congress, 1920, pp. 288-294.
- Colombo, G. L. Bilateral changes in cornea following exposure to cold in airman. (Bibl.) Brit. Jour. Ophth., v. 5, 1921, pp. 553-558.
- Elschnig, A. Keratoplasty. Heidelberg Ophth. Congress, 1920, pp. 331-332.
- Gradle, H. S. Present status of keratoplasty. (4 ill. Bibl.) A. J. O., v. 4, 1921, pp. 895-899.
- Grueter, W. Experimental and clinical studies of corneal herpes. Heidelberg Ophth. Congress, 1920, pp. 162-167.
- Lindgren, E. Treatment of cornea with lunar caustic in scrofulous keratoconjunctivitis. Hospitalstid., v. 63, 1920, pp. 33-36.
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- Macrae, A. Nodular keratitis of South Arabia. Brit. Med. Jour., Nov. 5, 1921, p. 739.
- Meisner. Congenital clouding of cornea. (2 ill.) Heidelberg Ophth. Congress, 1920, pp. 334-336.
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- Uhthoff, W. Epithelial dystrophy of cornea. Heidelberg Ophth. Congress, 1920, p. 308.
- Wolfrum. Regeneration of cornea. Heidelberg Ophth. Congress, 1920, pp. 332-334.
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- Zbikowski. Symmetric anterior ectasia of sclera. Rev. Med. de Sevilla, v. 40, 1921, pp. 16-18.

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- Gilbert, W. Studies of aqueous humor. Heidelberg Ophth. Congress, 1920, pp. 68-73.
- Kubik, J. Anatomy of angle of anterior chamber. (Dis.) Heidelberg Ophth. Congress, 1920, pp. 33-49.
- Lindner, K. Study of changes in ocular fluids. (4 ill.) Heidelberg Ophth. Congress, 1920, pp. 33-49.

**Wessly, K.** Question of iris dilatator and anterior chamber in human eyes. (1 ill.) Heidelberg Ophth. Congress, 1920, pp. 26-33.

**Westphal, A.** Pupil phenomena in epidemic encephalitis and "alternating absolute" rigidity of pupil. *Zelt. f. d. g. Neur. u. Psychiat.*, v. 68, 1921, pp. 226-240.

#### THE UVEAL TRACT.

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**Frede, N. di.** Malarial iritis. *Boll. d. Clin.*, v. 38, 1921, pp. 208-209.

**Gilbert, W.** Benign tubercular meningitis with acute choroiditis. *Deut. Arch. f. klin. Med.*, v. 137, 1921, p. 21.

**Hunter, W. B.** Traumatic aniridia. *Brit. Med. Jour.*, Nov. 19, 1921, p. 843.

**Peter, L. C.** Obscure forms of posterior uveitis, their relation to sinus disease. *Penn. Med. Jour.*, v. 25, 1921, p. 151.

**Thompson, H. M.** Tuberculous iridocyclitis cured with tuberculin. (Dis.) *A. J. O.*, v. 4, 1921, p. 928.

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**Wallace, F. E.** Chorioretinitis. (Dis.) *A. J. O.*, v. 4, 1921, p. 927.

Tuberculous iridocyclitis. (Dis.) *A. J. O.*, v. 4, 1921, p. 926.

#### GLAUCOMA.

**Ascher, K. W.** Diminished velocity of red blood cells in glaucoma. (5 ill. Dis.) Heidelberg Ophth. Congress, 1920, pp. 77-84.

**Axenfeld, T.** High myopia and glaucoma. Heidelberg Ophth. Congress, 1920, pp. 102-107.

**Brandt, R.** Experience with Elliot trephining. (1 ill.) Heidelberg Ophth. Congress, 1920, pp. 113-117.

**Cords, R.** Glaucoma and papillitis. Heidelberg Ophth. Congress, 1920, pp. 109-112.

**Gifford, H.** Peripheral iridotomy (Curran) in treatment of glaucoma. (1 ill.) *A. J. O.*, v. 4, 1921, pp. 889-894.

**Hamburger, C.** Mechanics of glaucoma and operations. Heidelberg Ophth. Congress, 1920, p. 102.

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**Koepe, L.** Stereomicroscopic picture of angle of anterior chamber with slit lamp in glaucoma. (5 ill.) Heidelberg Ophth. Congress, 1920, pp. 87-101.

**Roemer, P.** Experiments on hypotonus. (Dis.) Heidelberg Ophth. Congress, 1920, pp. 55-60.

#### THE CRYSTALLINE LENS.

**Becker, H.** Bilateral cataract and glaucoma after strong electric stroke. Heidelberg Ophth. Congress, 1920, pp. 294-296.

**Hektoen, L.** Specific precipitin reaction of lens. *A. J. O.*, v. 4, 1921, pp. 909-910.

**Higgins, S. C.** Cataract operation in aged. *A. J. O.*, v. 4, 1921, pp. 911-914.

**Jess, A.** Lime in lens albumin. (1 ill. Dis.) Heidelberg Ophth. Congress, 1920, pp. 224-230.

**Mann, I. C.** Aphakic human embryo. *Brit. Jour. Ophth.*, v. 5, 1921, p. 572.

**Smith, H.** Barraquer operation for cataract. (1 ill.) *Brit. Jour. Ophth.*, v. 5, 1921, p. 552.

Mature and immature senile cataract. *A. J. O.*, v. 4, 1921, pp. 900-905; (Dis.) 929-934.

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**Thompson, J. M., and Thompson, J. W.** Capsulotomy vs. intracapsular method in senile cataract extraction. *Colo. Med.*, Dec., 1921, p. 271.

**Tiscornia, A.** Bilateral cataract from lightning stroke. *Rev. de la Asoc. Méd. Argentina*, v. 35, 1921, p. 720. *Abst. J. A. M. A.*, v. 77, 1921, p. 1930.

#### THE RETINA.

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**Hecht, S.** Nature of foveal dark adaptation. *Jour. Gen. Physiol.*, v. 4, 1921, pp. 113-141.

**Jackson, E.** Fundus photography. *A. J. O.*, v. 4, 1921, pp. 935-937.

**Kuempel, R.** Lowered tension with retinal detachment. (Dis.) Heidelberg Ophth. Congress, 1920, pp. 231-234.

**Lenz, G.** Visual zone in malformation of eyes. Heidelberg Ophth. Congress, 1920, pp. 161-162.

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#### THE OPTIC NERVE.

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**Fuchs, E.** Senile changes in optic nerve. Heidelberg Ophth. Congress, 1920, pp. 182-185.

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**Comberg, W.** Peripheral visual fields. (7 ill.) Heidelberg Ophth. Congress, 1920, pp. 268-282.

**Del Rio, M. A.** Ophthalmic Migrain. Gior. d. Clin. Med., v. 2, 1921, p. 248.

**Oloff.** War results on hemianopic reaction. (Dis.) Heidelberg Ophth. Congress, 1920, pp. 196-199.

#### COLOR VISION.

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**Ferree, C. S., and Rand, G.** Variable factors which influence determination of color fields. A. J. O., v. 4, 1921, p. 925.

**Herwig, B.** Internal color sense of youth and relation to general question of light sense. Zeit. f. Psychol. u. Physiol. d. Sinnes., v. 87, 1921, pp. 129-210.

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#### THE EYEBALL.

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**Carrasco, E. A.** Ocular prosthesis and Dimitry's operation. Rev. Med. del Rosario, v. 11, 1921, pp. 1-11.

**Cook, F. S.** Panophthalmitis of endogenous origin. A. J. O., v. 4, 1921, p. 919.

**Liebermann, L. v.** Sondermann's plastic enucleation. Orvosi Hetil., v. 65, 1921, p. 275.

**Van Duyse, G. M.** Colobomatous microphthalmos; retropalpebral orbital cyst, and

intracystic retinal folds. Arch. Méd. Belges, v. 74, 1921, pp. 593-627.

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**Dupuy-Dutemps and Bourget.** Chronic dacryocystitis and lacrimation. Dacryocystorhinostomy. Acad. de Med., Nov. 22, 1921.

**Silva, L.** Prelacrimal Tumor. (2 ill.) Brazil Med., v. 35, 1921, pp. 115-118.

**Van der Hoeve, J.** Embryologic study of lacrimal passages. Nederl. Tijdschr. v. Geneesk., 1921, 2, p. 40.

#### DISEASES OF THE LIDS.

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